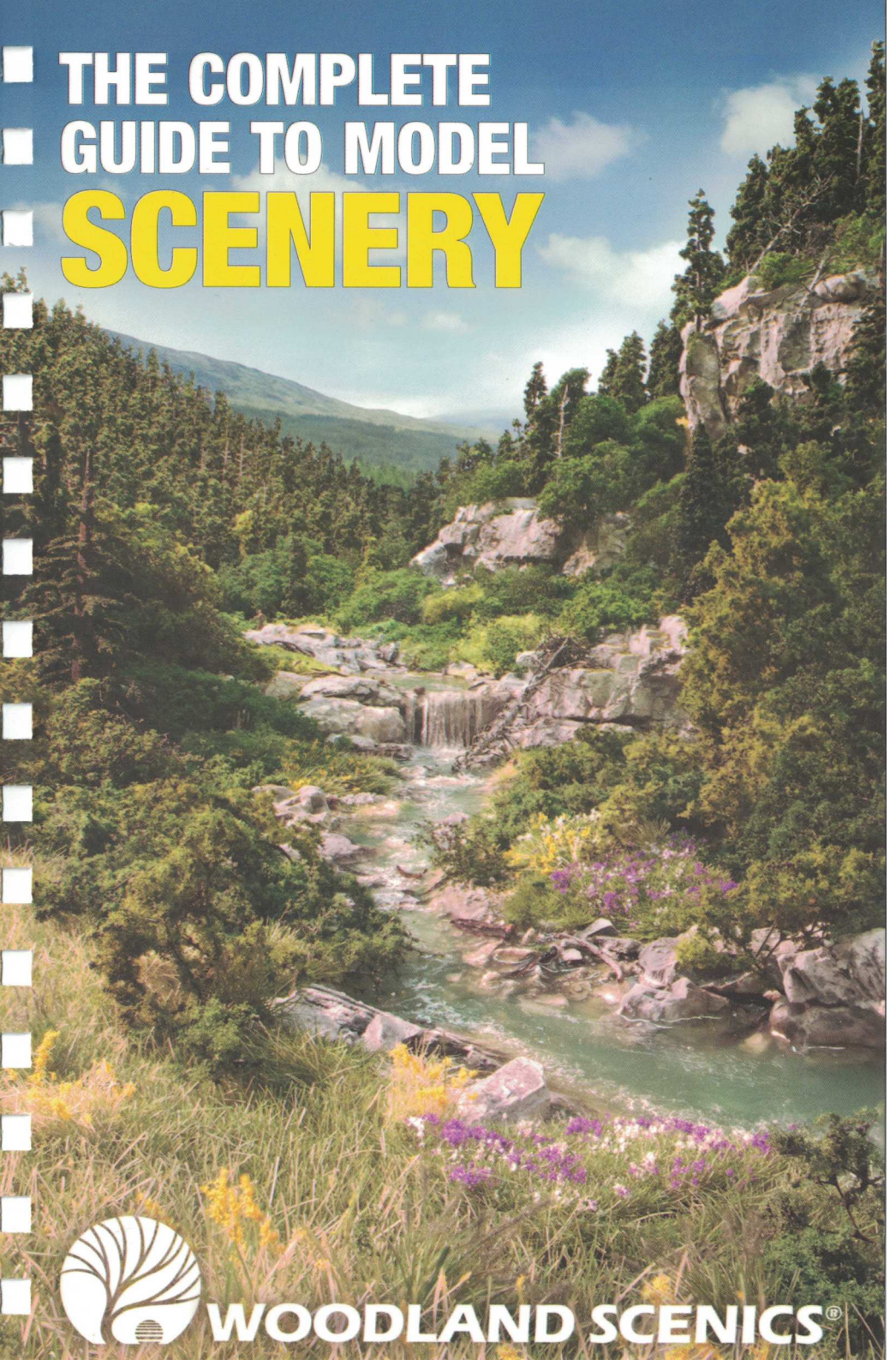
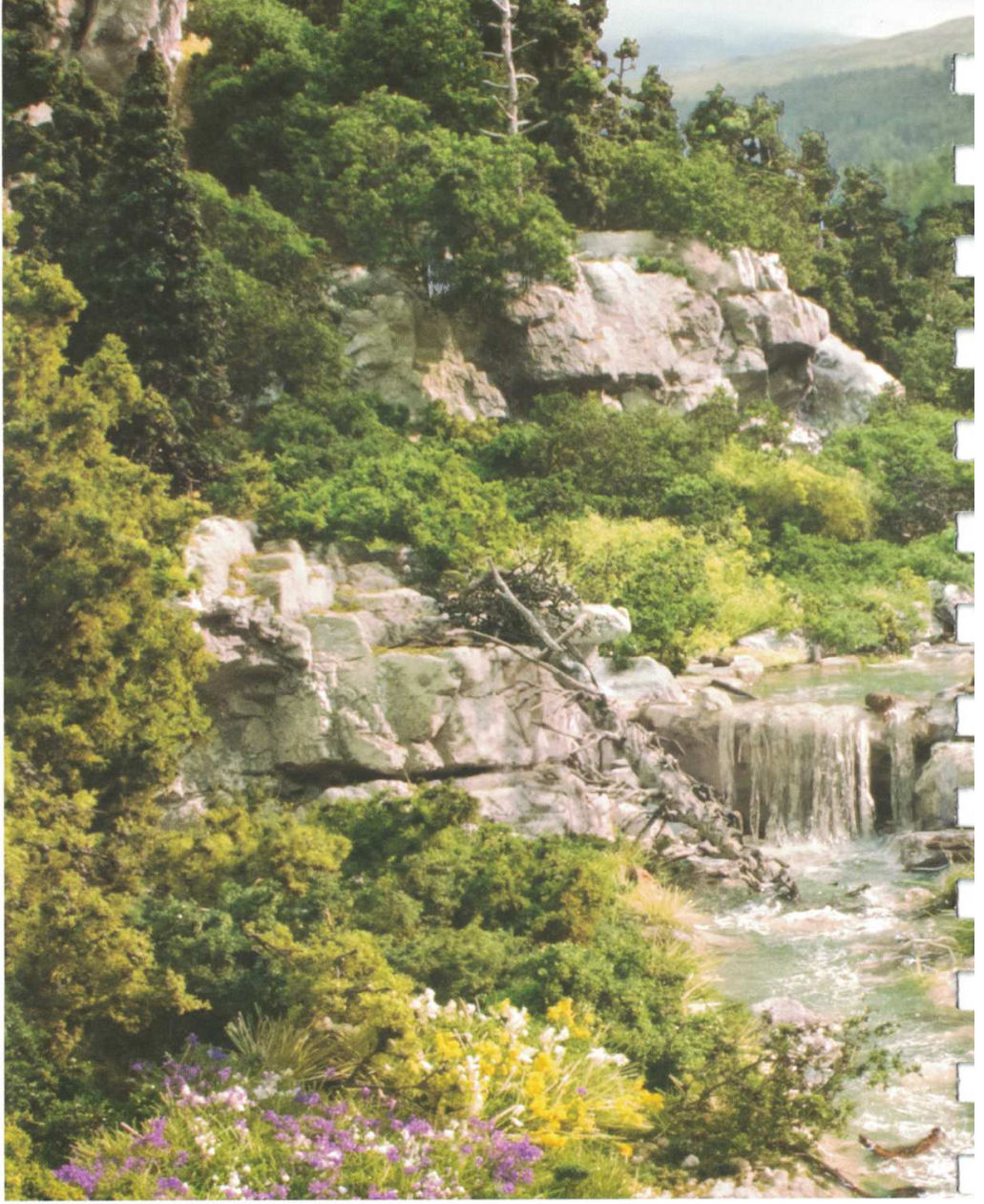
THE COMPLETE GUIDE TO MODEL SCENERY



WOODLAND SCENICS®



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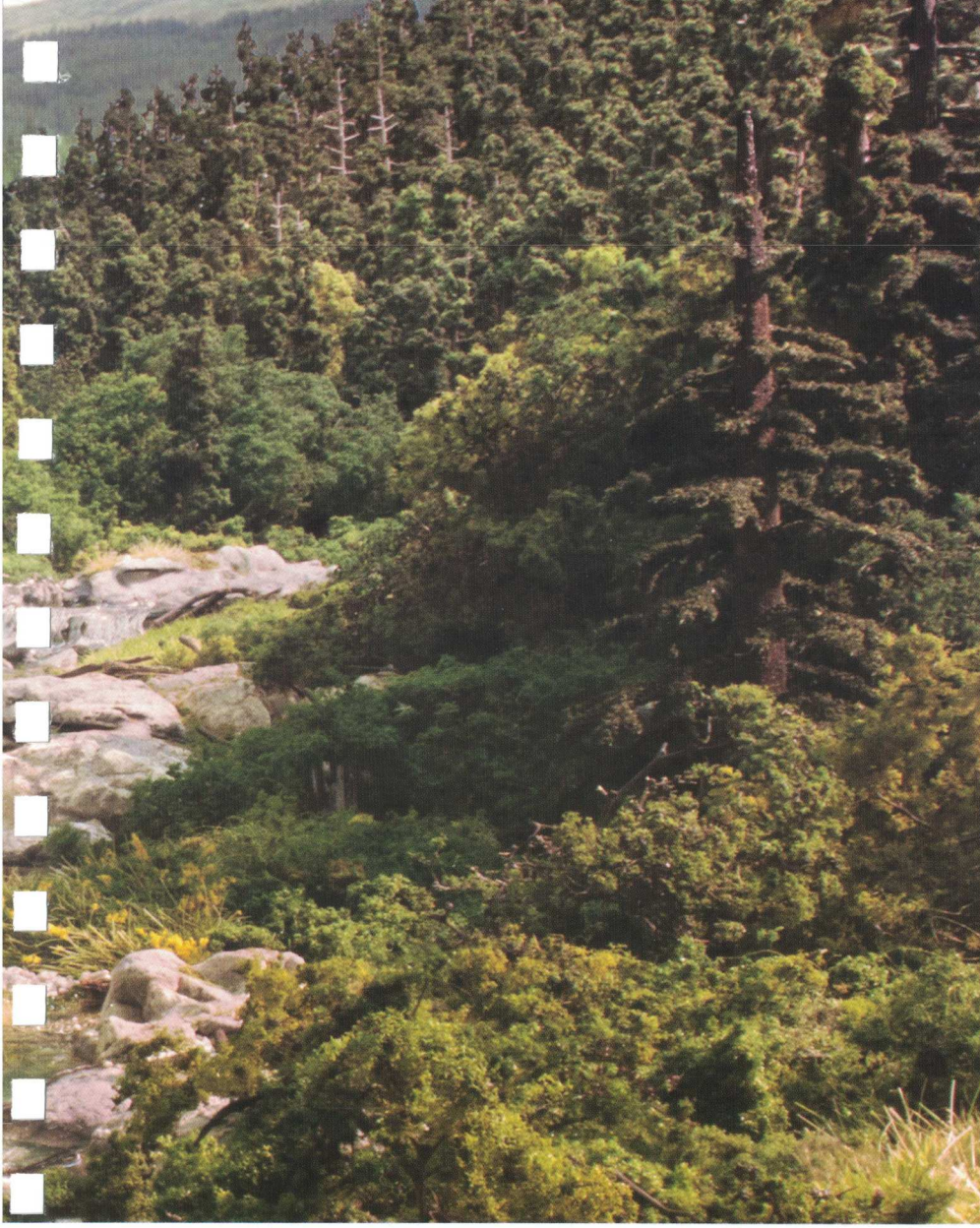
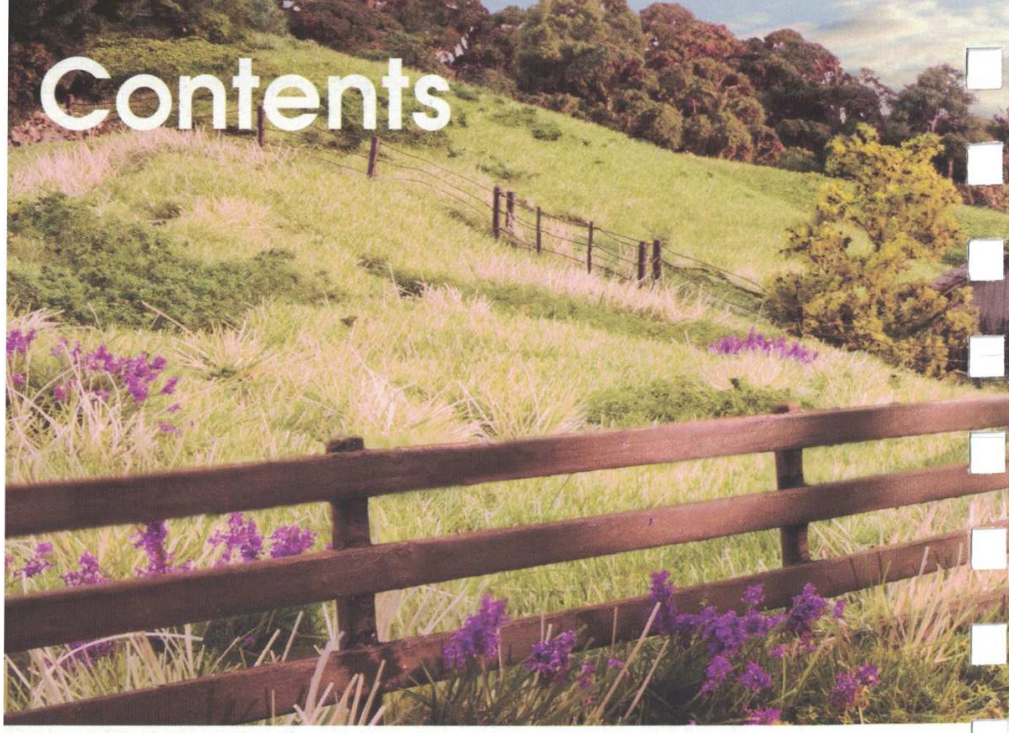


Woodland's desire to create realistic model scenery started as a small idea but quickly grew to change the industry. Initially an architectural modeling firm, Woodland launched the original Woodland Scenics line in 1975. From the beginning, our focus has been to provide high quality products that anyone can use to create life-like results. We offer a complete line of quality-tested products that work together to make modeling easy. While we have grown to offer more than 2,000 items spanning multiple markets, our purpose remains the same: We are fueled by passion and a commitment to innovation, creating unique products for people of all ages and skill levels.



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Woodland Scenics Videos

Visit our website and join us on social media to get the latest product announcements, videos and other information related to Woodland. We have over 300 videos that teach step-by-step methods, tips and techniques to get the best results with our products. Subscribe to our YouTube channel, sign up for our e-newsletter and follow us on social media platforms to stay up-to-date. Be sure to tag us in your posts for a chance to be featured!

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Visit our website to download the following apps, available for your smart phone, tablet or PC.

Water Volume Estimator
This fast and easy tool calculates how much Deep Pour Water or Realistic Water you need to create your water feature. Just put in the measurements of your water feature and let the Water Volume Estimator do the rest.

Model Scaler
Fast, easy and efficient scale model conversion tool. Quickly convert U.S. Customary and Metric measurements into any scale. Also available for Windows, Mac and Linux on the Chrome Web Store.

Model Inventory
Easy-to-use inventory app for tracking your model railroad locomotives, rolling stock, structures, scenery and accessories.

Chapter 1 Page 23-56

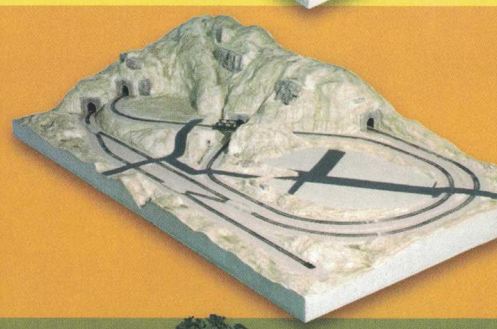
SubTerrain

The SubTerrain chapter details how to create a layout base, transfer layout plans and determine grades for train tracks. It provides instructions for building the understructure of your layout with SubTerrain foam components.

Chapter 2 Page 57-100

Terrain

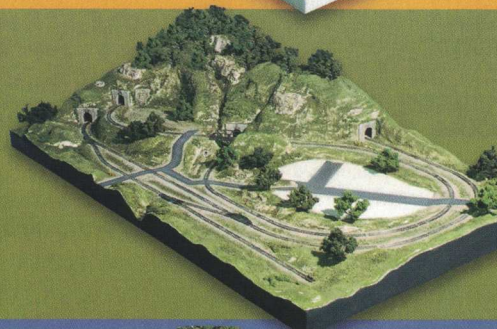
The Terrain chapter gives modelers a detailed comparison of terrain building techniques with both Plaster Cloth and Shaper Sheet. It discusses mixing plaster, making your own rock molds, using Rock Molds, casting rocks, customizing and installing rocks, laying Track-Bed and creating paved roads.



Chapter 3 Page 101-202

Landscaping

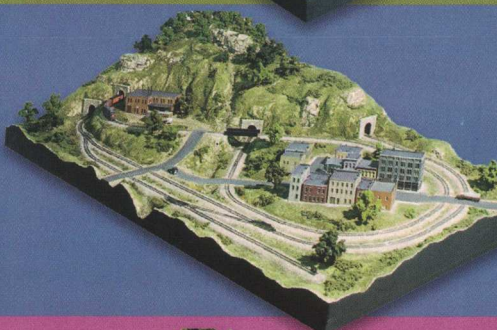
The Landscaping chapter provides in-depth instructions on coloring the terrain shell and rocks, creating gravel roads and modeling rock debris. Learn how to create ground cover, undergrowth and trees so you can model realistic grasslands, deserts, forests, water features and snowy landscapes.



Chapter 4 Page 203-236

Structures & Detailing

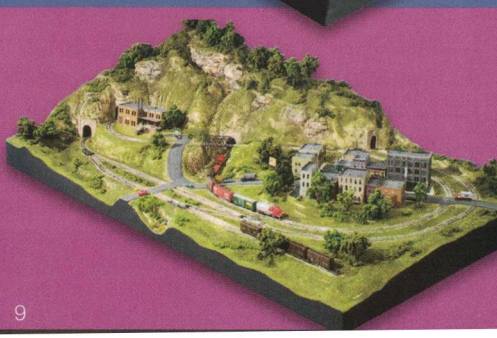
The Structures and Detailing chapter instructs you how to use Built-&-Ready structures and other pre-lit items with the Just Plug Lighting System. It includes assembly and installation tips and techniques for modular structures, including lighting unlit items and structures. This chapter also offers tips and techniques on weathering, decals and figures.



Chapter 5 Page 237-248

Cleaning & Maintenance

The Cleaning and Maintenance chapter teaches you how to maintain your layout and protect your investment. It goes over the proper methods to clean dusty foliage, water features and grimy railroad tracks.



Introduction

In a world where we often have little control over our surroundings, building a model offers the opportunity to be in charge. You get to create a world of your own design and realistic scenery is what makes your miniature world come to life. The scenic backdrop you create gives your model a setting—a when and where. Whether your layout is based on a real place or an imaginary location, the choices you make constitute your modeling premise.

With Woodland Scenics products, creating realistic scenery is within the ability of any modeler from beginner to expert, even if you don't consider yourself artistically talented. This book will take you through the steps of building a diorama. Some examples may mention a specific type of modeling to explain a technique or concept, but they can be used in any type of modeling: railroads, military models, dioramas, architectural models, dollhouses, gameboards and even school projects.

No matter what you are modeling or how far along you are in the process, you will find this book helpful. All chapters are color coded for ease of navigation. Use the colored tabs on the side as a guide. The Table of Contents shows the major topics covered in each chapter with page numbers, so you can easily find a topic you want to know more about. To achieve optimal results, it is best to read each chapter in its entirety before building on to your layout.

Each chapter provides product descriptions before providing information about how to use that product. This will help you select the products that will be the most useful for your model. Woodland Scenics products are designed to work together, and some are meant to be applied in a particular order.

For example, Woodland Scenics landscape products are meant to build on top of each other (i.e. apply ground cover before undergrowth). To follow this process, the products are introduced in an intentional order. If this is skipped around, you could miss a vital part of instruction. Throughout each chapter, there will also be page numbers for your reference if you wish to go to a specific product or technique.

Woodland Scenics products are available at your local hobby shop or on our website. When you purchase product, you will receive complete instructions for the product. Visit woodlandscenics.com to see our complete product line and view how-to videos. Look for the ONLINE VIDEO icon throughout the book, which indicates a video is available for a specific product or concept.

For your reference, there is a Glossary of terms at the back of the book (pages 252-253). These terms are also defined when mentioned in the text.

Thank you for your interest in this manual.

GETTING STARTED

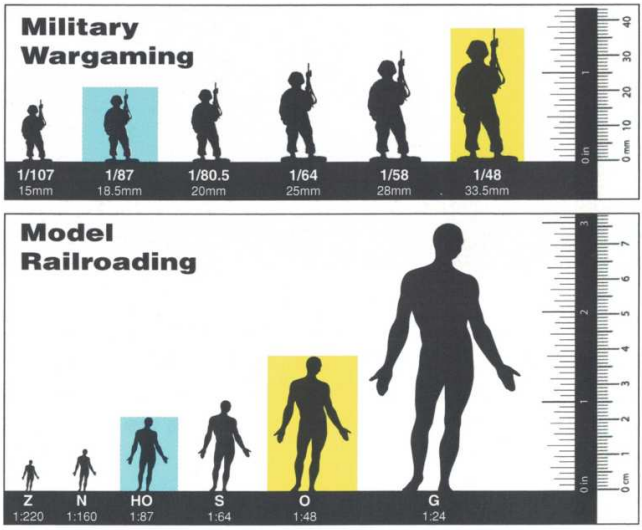
FIND YOUR WORKING SPACE

Finding the right space to build your model is important. You can use an extra room in your home, or you may construct a separate out-building in your backyard. Successful models have been built in such unlikely areas as wine cellars, utility rooms, former bomb shelters and on shelves circling a bedroom. Remember, the size of your workspace will impact the potential size of your layout.

Other factors to consider include temperature, cleanup and outlets for providing power. Environmental conditions like sunlight, heat and humidity can cause increased dry times and potentially deteriorate your model over time. If your location is particularly dusty, this can cause your layout to look dirty or affect the end results of different features. Keep these factors in mind when choosing your workspace.

SCALE

Scale refers to the relationship between the sizes of two items. There are many modeling scales, with pieces ranging from buildings small enough to hold in the palm of your hand to model trains that are large enough to ride.



The type of modeling you participate in will influence how your scale is written. HO Scale is a common scale in many types of modeling and can be written in any of the following ways: HO Scale, 1:87, 1/87 and 18.5 mm. In this scale, 1" on the model would represent 87" in the real world. Wargamers and military modelers would most likely use the terms 18.5 mm or 1:87 for this scale, while a model railroader is more likely to use HO Scale. See illustrations above for examples of common modeling scales.

There are a number of things to consider when you are choosing your scale. Are you a gamer who needs to adhere to specific game rules? Do you have limited working space? Do you want the ability to choose from a wide variety of details?

Details like structures and figures are not available in every scale. However, the majority of scenery items have no real scale since real-world trees, bushes, grasses, mountains and streams all occur in a variety of sizes. Woodland Scenics scenery materials can be used in most scales for any kind of modeling. Products like buildings or vehicles that are designed for a particular scale have that information listed on the product label.

GEOGRAPHIC LOCATION

Cities, grasslands, mountains, volcanos, rivers, oceans, and deserts all have one thing in common—they are geographic features of a landscape. Each feature contains scenery unique to that location. Buildings, vehicles, wildlife, vegetation, people and terrain vary depending upon location. You can model any real or imaginary place, but determining a location will enhance your choice of scenery and help you tell your model's story, select products, and develop construction plans.

When you choose a location, be as general or specific as you want. Model a particular county in Colorado, a small town in the French countryside, a representative British town or a typical lumbering area in the Northwest of the United States. Pick a geographical location that contains scenery you would enjoy researching and building.

Keep in mind the extent of the geographic location you choose to model may be determined by the scale and size of the layout you plan to build. The larger the scale, the more actual space is required to model a specific area.

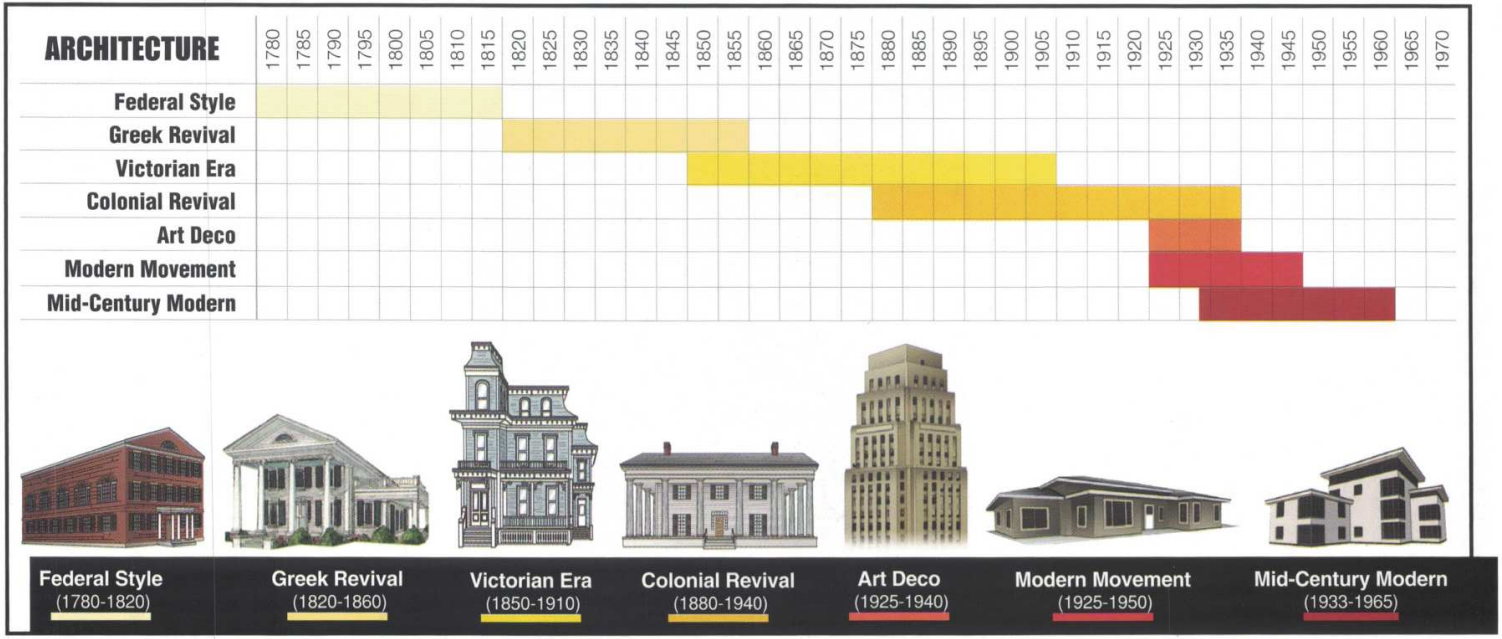
SELECTIVE COMPRESSION

Sometimes the features you wish to model are large, even when they are scaled down. This can be problematic if you have limited space for your layout. Modelers can overcome space constraints with selective compression. Selective compression is the method of condensing features to fit the available space while retaining key elements that make the scene recognizable. Use a couple of mountains to represent a mountain range, or model the most important buildings instead of every structure in a town.

Selective compression can also involve adjusting the scale so features look more realistic. Roads are an excellent example. If your road has dashes down the middle, the lines may appear too far apart if you keep the spacing and size true to scale. Instead, adjust the lines so they appear realistic on your model.

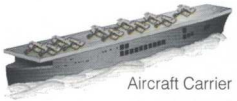
TIME ERA

The time era you choose can have a big impact on what will look realistic on your layout. Wargamers often focus on post-apocalyptic, medieval or futuristic themes depending on the game they are playing. A military modeler usually chooses a specific war. Model railroaders may make their choice based on the trains they wish to use, such as Steam Engines compared to Diesel Engines. Choosing a time era helps you select the appropriate buildings and details, and sticking to a specific time era keeps your layout looking as realistic as possible.



MILITARY WARGAMING

	1775	1780	1785	1790	1795	1800	1805	1810	1815	1820	1825	1830	1835	1840	1845	1850	1855	1860	1865	1870	1875	1880	1885	1890	1895	1900	1905	1910	1915	1920	1925	1930	1935	1940	1945	1950	1955	1960	1965	1970	1975
American Revolutionary War																																										
American Civil War																																										
World War I																																									
World War II																																									
Korean War																																									
Vietnam War																																									



American Revolutionary War (1775-1783)

American Civil War (1861-1865)

World War I (1914-1918)

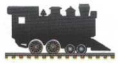
World War II (1939-1945)

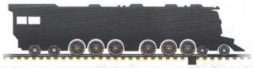
Korean War (1950-1953)

Vietnam War (1955-1975)

MODEL RAILROADING

	1830	1835	1840	1845	1850	1855	1860	1865	1870	1875	1880	1885	1890	1895	1900	1905	1910	1915	1920	1925	1930	1935	1940	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	Present
Early Steam																																			
Middle Steam																																			
Late Steam																																			
Transition to Diesel																																			
Modern Diesel																																			





Early Steam (1831-1880)

Middle Steam (1881-1921)

Late Steam (1922-1940)

Transition to Diesel (1941-1960)

Modern Diesel (1961-Present)

GAUGE

Picking a time era is particularly relevant in model railroading because of a railroad's gauge, which is the distance between the rails. In 1886, a federal law was passed setting a standard gauge for railroads in the United States at 4' 8 1/2". This standardization meant engines and cars could run on any track.

There were a few specialty railroads in the United States that did not follow the standard gauge. They are known as narrow gauge because their rails are closer together than the standard gauge. These railroads ran primarily in mountainous areas where construction problems made it more advantageous to use a narrower track, a tighter radius on curves, and shorter engines and cars. A variety of gauges were used on the tracks, with 3' being one of the most common. A few narrow gauge rail lines are still in operation today.

It is possible to model standard gauge or narrow gauge. The National Model Railroad Association (NMRA) has developed standards for manufacturers to make the engines, rolling stock and track interchangeable in each scale and gauge. Standard gauge equipment and track are available in all scales. Some scales will offer more options than others.

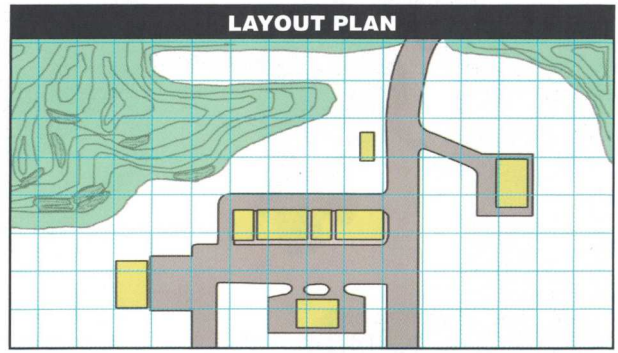
LAYOUT PLAN AND TRACK PLAN

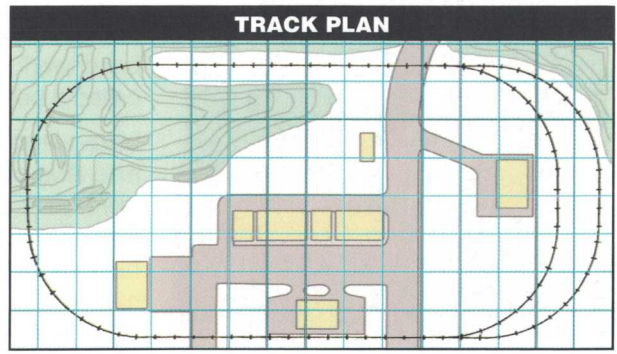
It is important to plan how you want your layout to look. This may be an elaborate scale drawing or just an idea jotted down on scrap paper. It should include at least a general concept of geographical features like mountains or bodies of water, as well as any plans you may have to include towns, track, industries, etc. This sketch is called a layout plan.

Every modeler should have a layout plan, but model railroaders also need a track plan. A track plan indicates where track should run on the layout and if any overpasses or other features must be built. The track plan is part of the overall layout plan. If you are building a model railroad, plan the track first and then work other items in around it. Start by selecting a track plan from a plan book or designing your own. For beginners, we recommend using an established track plan. Layout and track plans may change before the building stage begins.

If there is a particular building or scenery item that must be included, plan for it early and know the dimensions of the space needed. Be sure to consider where the train needs to go on your layout and if it needs to pass by any specific buildings. Also keep in mind other important factors such as the radius of curves, clearance around planned geographical features, the grade of the track and a realistic appearance.

Grade is an especially important factor in model railroading because the track plan must work with the layout's geographical features while still allowing the train to travel around the track. Grade is the degree of elevation change between two points over a specific distance. If the grade on a hill is too steep, a train may have trouble ascending the hill. Creating and adjusting grades will be discussed in detail in the SubTerrain Chapter.



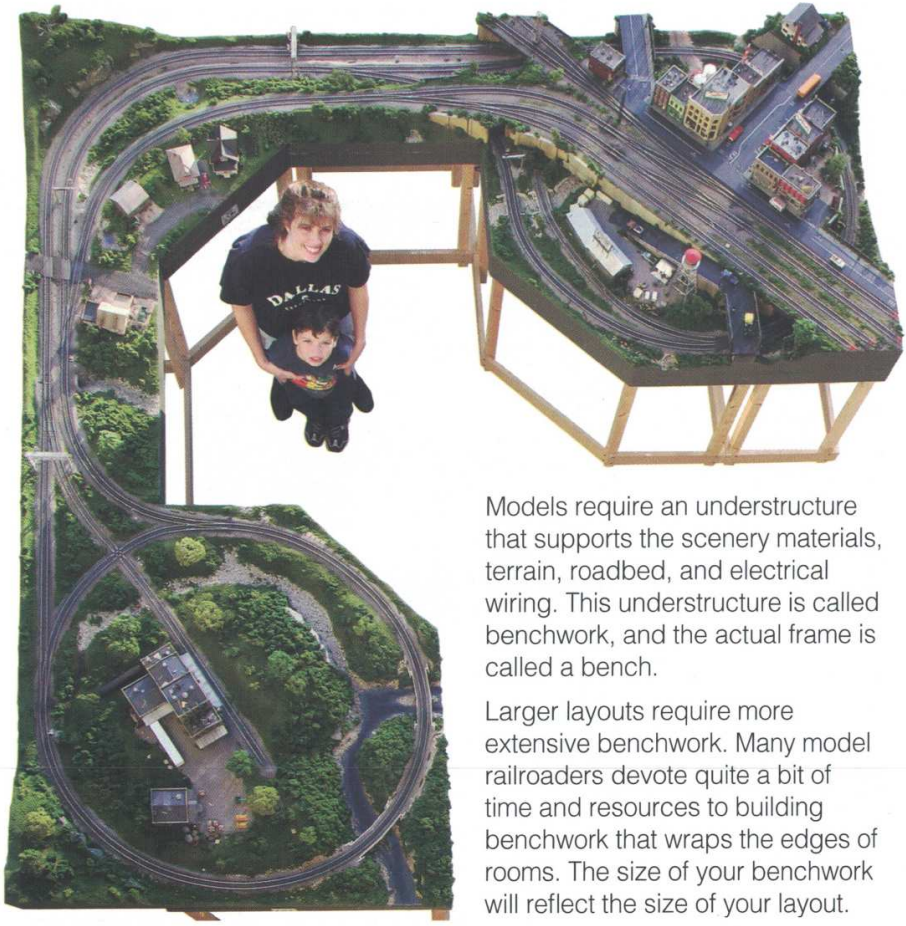


LAYOUT BASE

The material that you build your model on is called the base. Your layout base size and material will be determined by the scale, type of modeling, geographical features and space you have available to model in.

Starting small is best. If you are new to model scenery, consider building a small diorama on a 1/2" Foam Sheet (or thicker) (page 26) or on Shaper Sheet (page 61) to familiarize yourself with the products. A project this size can be executed on a kitchen table. New modelers with limited workspaces can build a layout on a sheet of plywood. In smaller scales, a module or two can be an entire model railroad.

BENCHWORK



Models require an understructure that supports the scenery materials, terrain, roadbed, and electrical wiring. This understructure is called benchwork, and the actual frame is called a bench.

Larger layouts require more extensive benchwork. Many model railroaders devote quite a bit of time and resources to building benchwork that wraps the edges of rooms. The size of your benchwork will reflect the size of your layout.

WOODEN BENCHWORK

A bench needs to be strong enough to support the railroad, yet open enough to allow access to maintain and repair the railroad or lighting. It should also hide construction features like wiring. Building benchwork is not necessarily for everyone. You need some knowledge of construction principles and skill with power tools. At a minimum, you will need a drill, screws, nuts, bolts, washers, a saw to cut lumber, a level, measuring tape, and a space big enough to work in. If you do build your own bench, we recommend pinewood for your building material.

Benchwork can be permanent, but you may wish to consider making it removable should you decide to move. If you build in modules, you can plan individual modules for later inclusion in a larger layout or they can be stand-alone. Consider whether the module will be taken down and stored at times. If so, foldable or removable legs under the frame may be desirable.

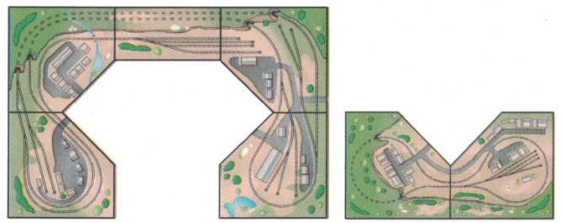
Please note this type of benchwork is not addressed further in this book. For easy benchwork options see the Module section.

MODULES

Before buying a big sheet of plywood, consider building a module. Modules are small models that can be combined to create a larger layout. Modules can be a cost-effective option for beginners and allows modelers to focus on one section of the layout at a time, rather than trying to build a large model all at once. Modules can be stored and are much easier to transport than one large model. This makes modules great for wargamers and modelers who want to take their dioramas to shows.

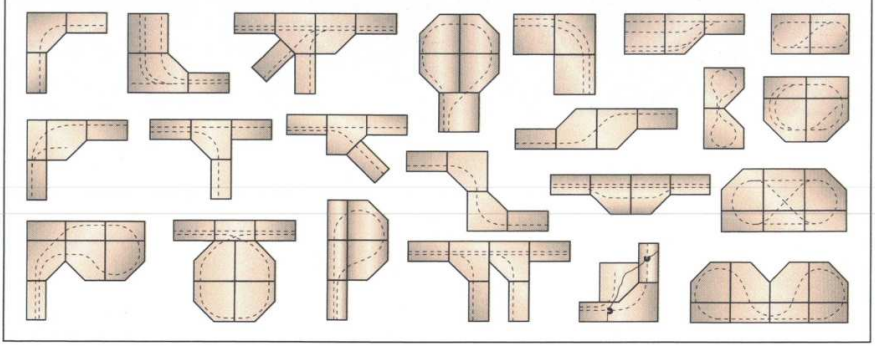
Some model railroaders form modular clubs where each person is responsible for one module, and the modules are combined when the group meets. Modular groups usually establish a plan for how each module is to be constructed so that it will coordinate with others in the group. Be sure to work closely with others in your group when planning your module. You will want pieces like rivers, roads and track to connect properly with other module pieces.

N SCALE TRACK PLANS



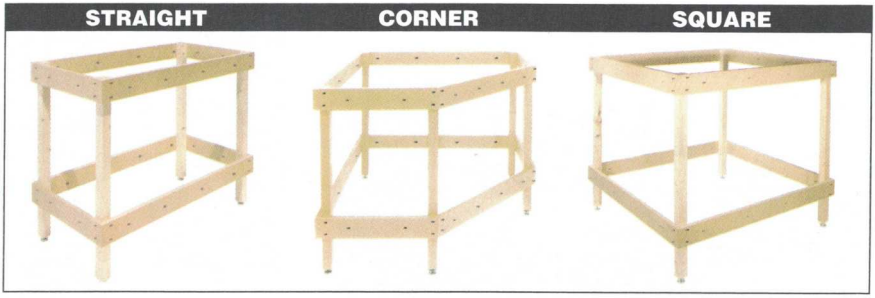
HO SCALE TRACK PLANS

ENDLESS POSSIBILITIES

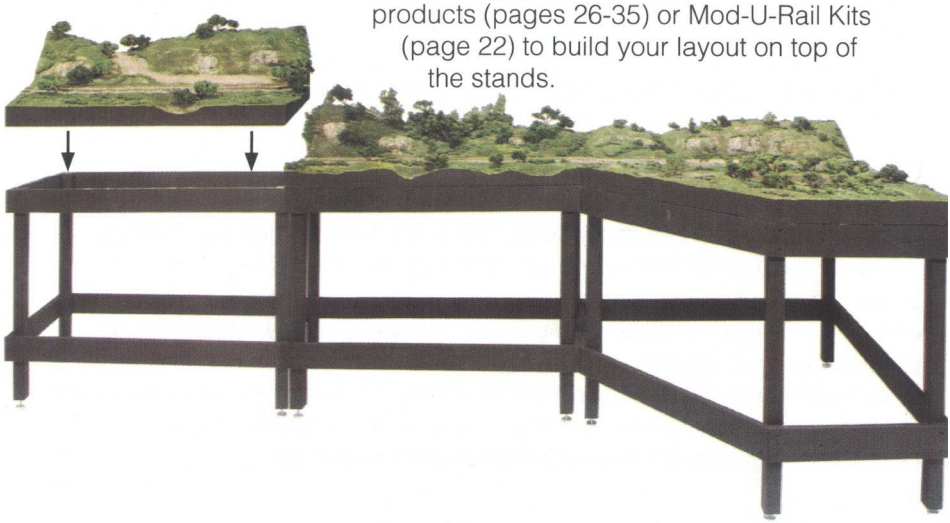


MOD-U-RAIL® STANDS

The Mod-U-Rail Stands are an easy benchwork option that does not require any special knowledge, calculations or power tools. They are premeasured, precut and predrilled wooden stands that are lightweight, durable and easy to assemble. Each stand is 35 1/2" tall with adjustable feet to simplify leveling.

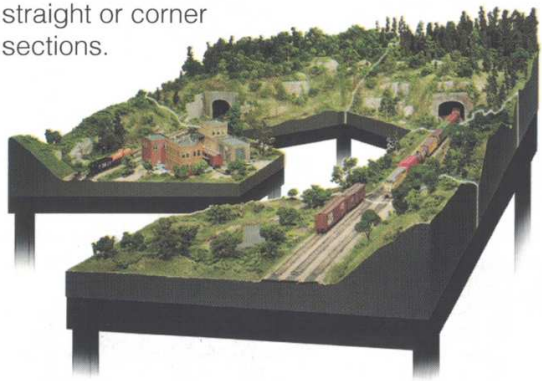


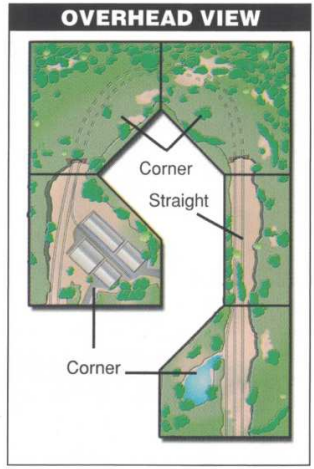
Mod-U-Rail Stands are available in three styles: Straight, Corner and Square. Use multiple stands and bolt them together to design your layout with an endless number of configurations. Then use SubTerrain products (pages 26-35) or Mod-U-Rail Kits (page 22) to build your layout on top of the stands.



MOD-U-RAIL KITS

Mod-U-Rail is an excellent option for a new modeler with limited space. Our Mod-U-Rail Kits allow a model railroader to easily design, build and landscape a custom lightweight layout per specific space requirements. While designed for model railroaders, Mod-U-Rail kits contain terrain and landscaping materials that can be used for any kind of modeling. Mod-U-Rail Kits are available for straight or corner sections.





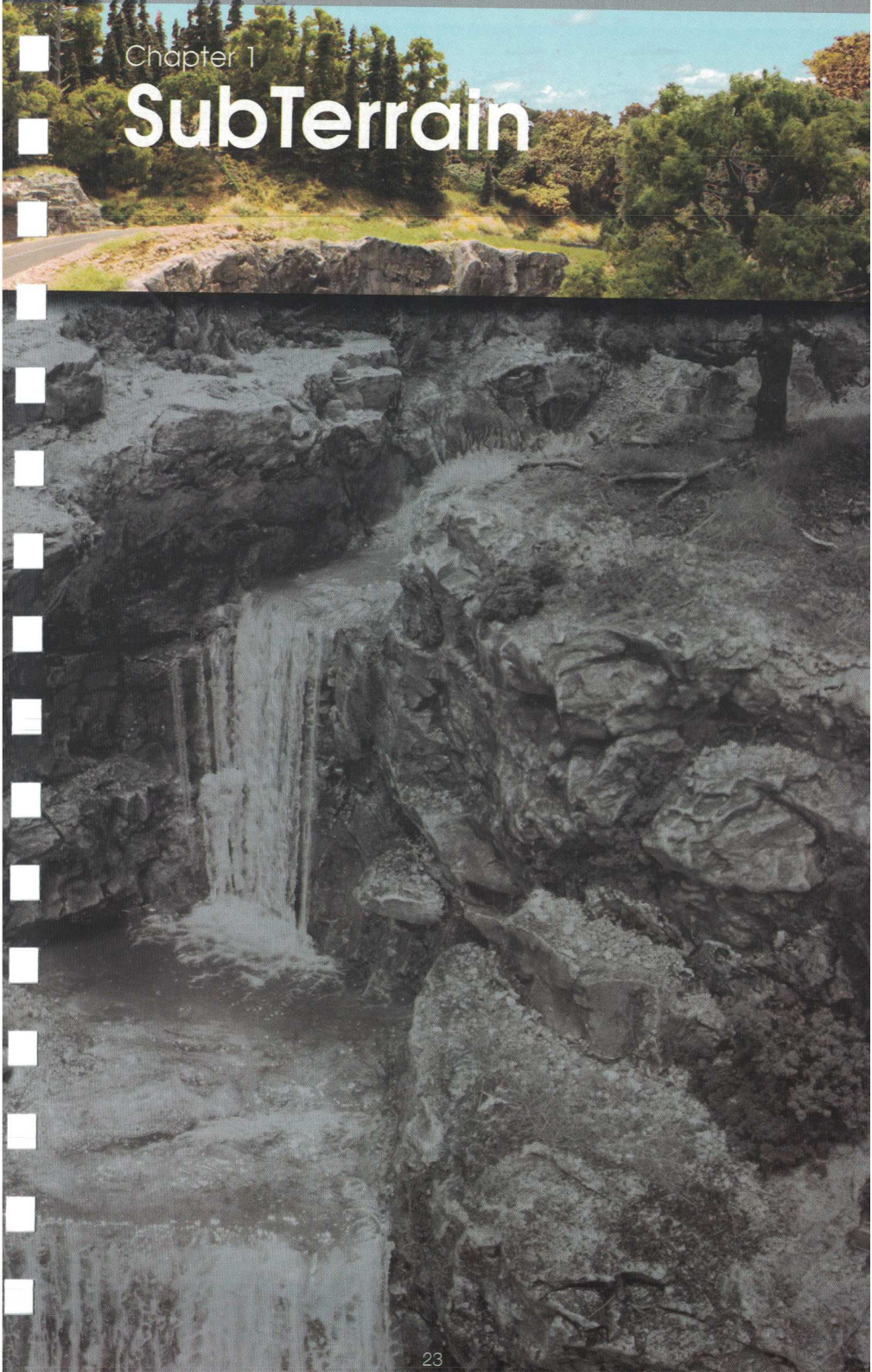
WIRING

When building benchwork, you need to consider whether you will need wiring for your model. It is usually easier to have wiring complete before beginning scenery. This wiring is necessary to operate trains and add lights. Whether you're a crafter making a sculpture, a wargamer lighting a mysterious cave or an architectural modeler making a building look occupied, adding lights is an easy way to add interest to a model.

Just like building your own custom benchwork, installing lighting may seem daunting. The Just Plug Lighting System is a quick and easy way to add realism and interest to your model without any special tools or electrical knowledge. For more information on the Just Plug Lighting System, see pages 215-231.

BEGINNER KITS

While most mistakes are easily corrected, some features can be difficult to modify once they are installed. If you familiarize yourself with the products, you are less likely to make these mistakes. Beginner kits, such as Layout Kits, Learning Kits and the Static Grass Starter Kit, are great ways to learn and practice before beginning your layout. Use kits to build your confidence, get a taste of your own creativity and learn how easy it is to achieve realistic results. These kits will address a variety of concepts such as modeling with Static Grass, building a road, creating a water feature and more.

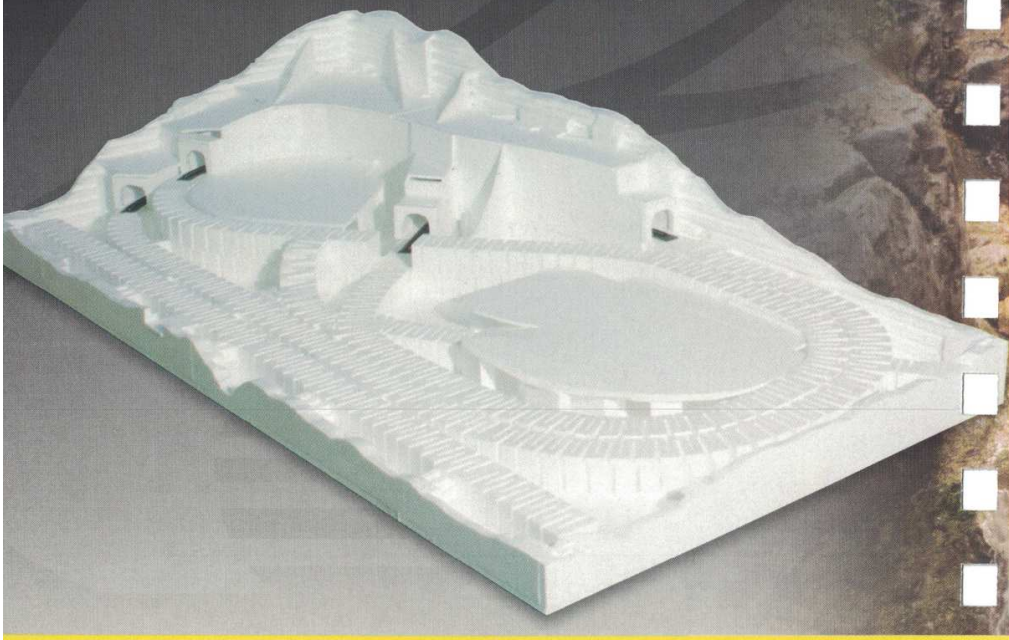

Chapter 1

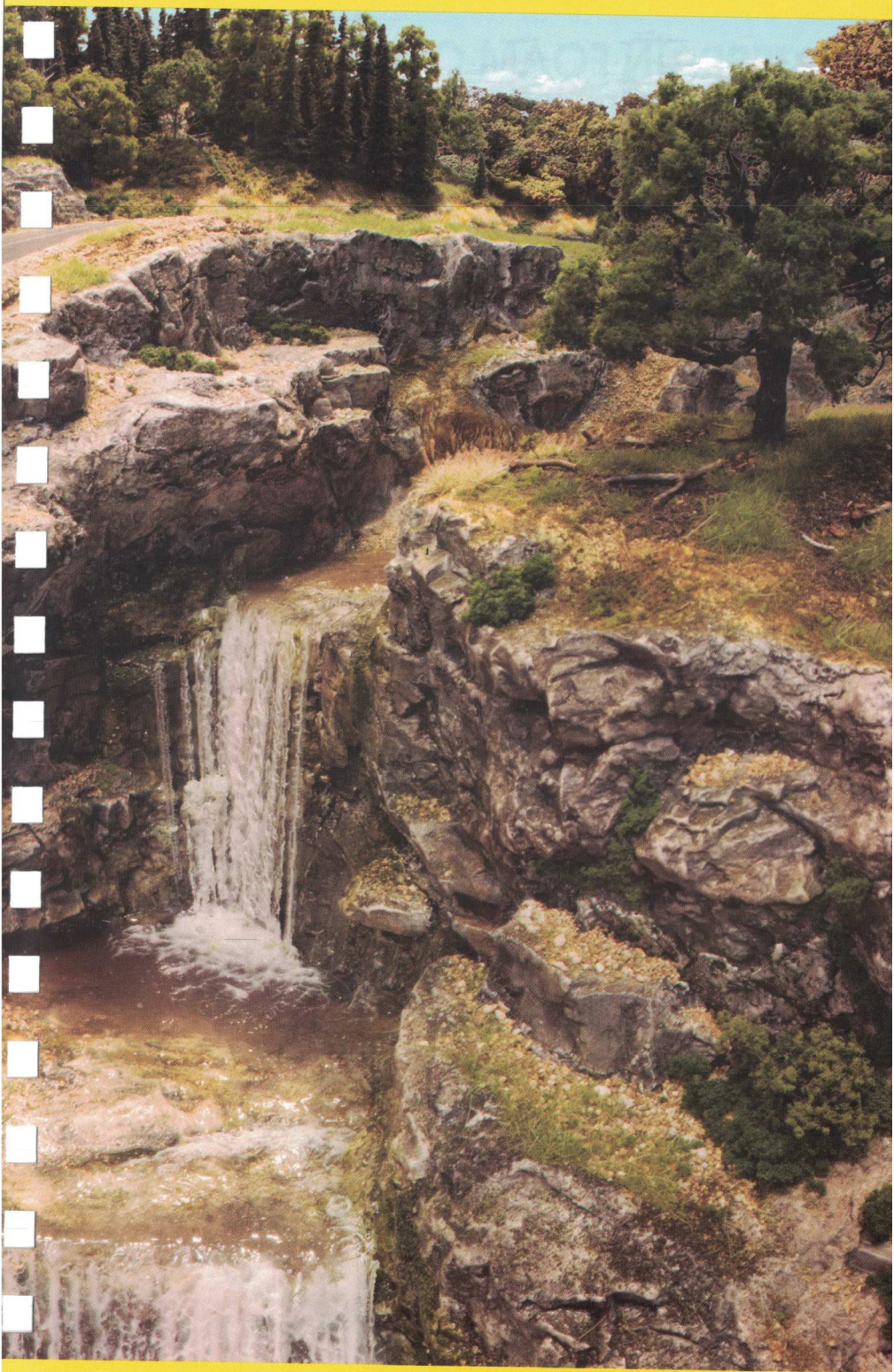
SubTerrain

The SubTerrain Lightweight Layout System® consists of durable, high-density and non-toxic foam components that take the guesswork out of designing and building a layout. This system is extremely adaptable and expandable to any layout plan and includes all necessary tools and accessories. Since this system is so lightweight, SubTerrain is ideal for situations where the layout will have to be moved, when space is limited or for modular layouts.

SubTerrain is different from older methods of building model railroad layouts, so we recommend familiarizing yourself with the entire process before using the SubTerrain System. We use model railroading as an example for using these products, but if you are not a model railroader, do not overlook these items. The SubTerrain products and techniques can be used for multiple scales and types of modeling.

All SubTerrain products are described at the beginning of this chapter. Then, you will learn how to use the products together. Read through this section focusing on the key descriptions of each component and take notes of how you could use them in your style of modeling. Notice the colors used to indicate each product. These colors will be used throughout this chapter to indicate which pieces of SubTerrain are being used.





SUBTERRAIN FOAM COMPONENTS ONLINE VIDEO

The SubTerrain System's foam components are like puzzle pieces that are designed to work together to create any layout you can imagine. All foam components in the SubTerrain System are made of high-density, non-toxic foam. These products have limitless uses in all types of modeling. Read through this section focusing on the key descriptions of each component and take notes of how you could use them in your style of modeling.

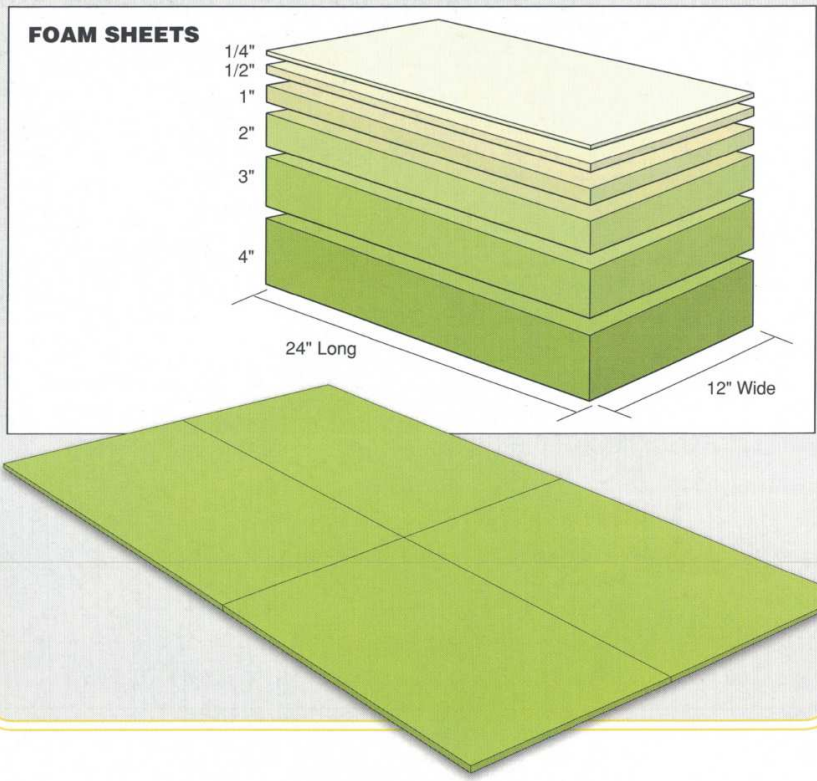
As you read this section, notice the colors used to indicate each product. These colors will be used throughout this chapter to indicate which pieces of SubTerrain are being used.

Product Overview

Foam Sheets

Use Foam Sheets as a lightweight layout base, to enclose tunnels, build bridges, create interior terrain profiles, form level areas for buildings and towns, or build structures. Thinner sheets are great for creating things like tunnel walls, and thicker sheets can be carved or used to support heavy terrain like water features.

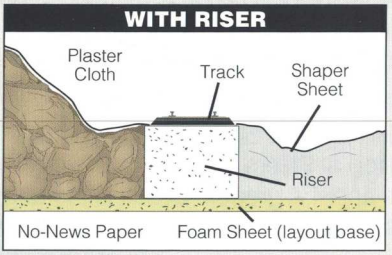
The number of Foam Sheets and Support Panels you may need is dependent upon the number and size of raised level surfaces you plan to have. Measure the spaces you need to fill and purchase the number of Foam Sheets you need accordingly. Foam Sheets can also be glued together at the ends to create larger sections if necessary. If the seam will be weight bearing, make sure it is supported underneath with benchwork or support foam.

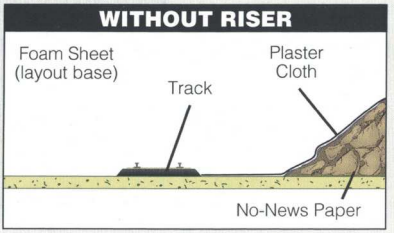


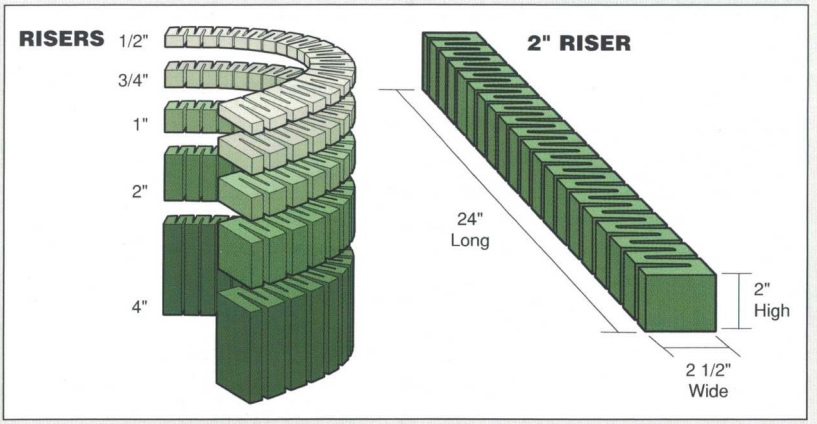
Risers

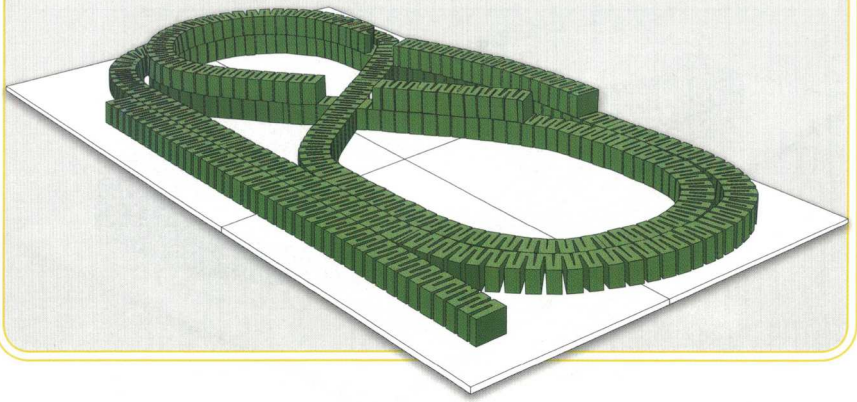
Risers allow modelers to quickly elevate roads and track to create dramatic terrain like ravines, creek beds and valleys without cutting into a layout's base. Risers are formed into a compact accordion shape with smooth, flat sides. This shape is flexible enough to easily form realistic curves and flat enough to support train tracks. Risers are 2 1/2" wide, 24" long and available in 1/2", 3/4", 1", 2" and 4" heights.

Risers will be placed under the entire track or road. To determine how many Risers you need, simply measure the total length of your track or road in feet. You will need the same number of feet in Risers. The higher you want to increase your elevation, the more Risers you will need.









INCLINES/DECLINES

Incline/Decline Sets and Starters are used to create a smooth transition from one elevation to another without complicated calculations, guesswork or wood construction. They will be needed anywhere that your track or road will climb over planned terrain features like mountains, tunnels and overpasses.

Sets are multiple pieces that are used together to create one incline or one decline, while Starters are one piece. Starters are designed to be stacked on top of Risers to create custom grades. Both products are available in 2%, 3% and 4% grades. Grade is the degree of elevation change over a specific distance. The larger the grade percentage, the steeper the slope.

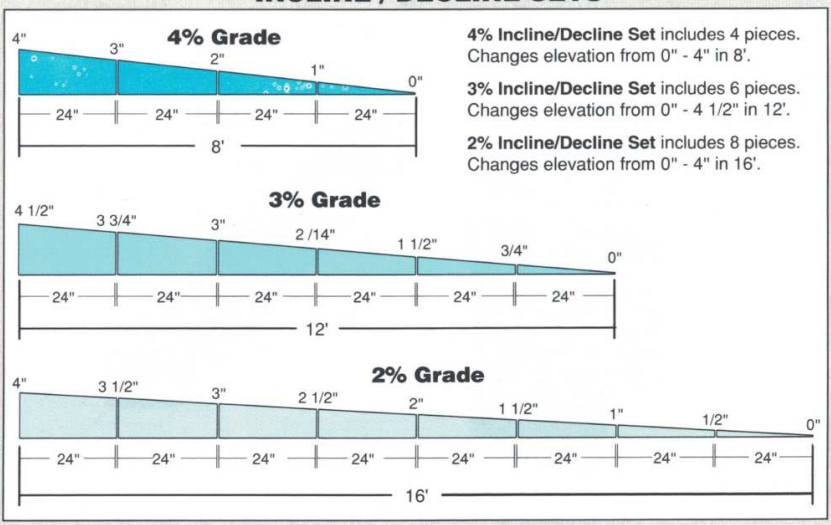
Product Overview

Incline/Decline Sets

Incline/Decline Sets are ideal for grades that grow gradually over a long distance, as often found on railroad lines. Sets are ideal for the beginning model railroader.

GRADE	RISE OVER 2'
2%	1/2"
3%	3/4"
4%	1"

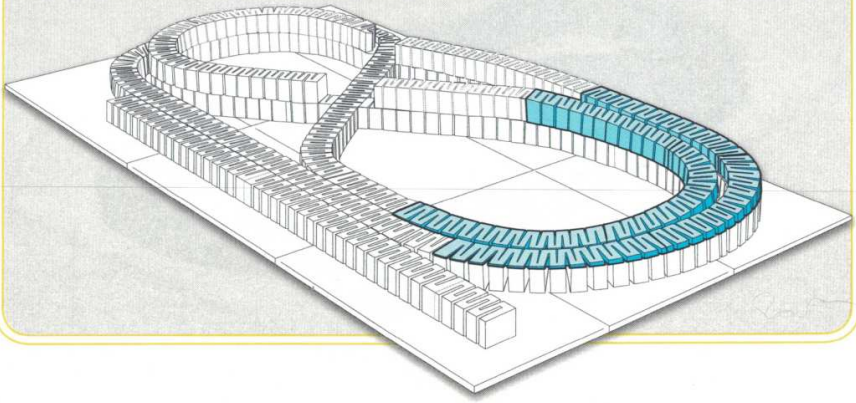
INCLINE / DECLINE SETS



4% Incline/Decline Set includes 4 pieces. Changes elevation from 0" - 4" in 8'.

3% Incline/Decline Set includes 6 pieces. Changes elevation from 0" - 4 1/2" in 12'.

2% Incline/Decline Set includes 8 pieces. Changes elevation from 0" - 4" in 16'.

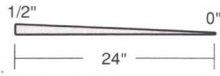


Incline/Decline Starters

Starters make it easy to create terrain with gently rolling hills. Starters allow modelers to create grades over shorter distances. Starters are also used to create inclines for road crossings and ramps, since each Starter tapers to 0%.

INCLINE / DECLINE STARTERS

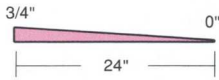
2% STARTER



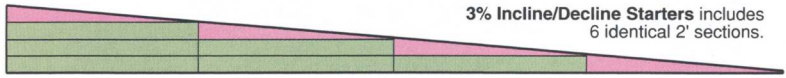
2% Incline/Decline Starters includes 8 identical 2' sections.

shown with 1/2" Risers

3% STARTER

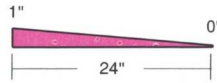


3% Incline/Decline Starters includes 6 identical 2' sections.

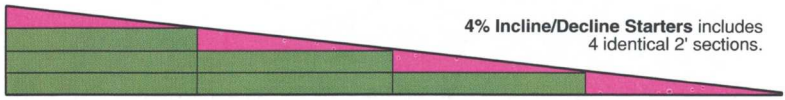


shown with 3/4" Risers

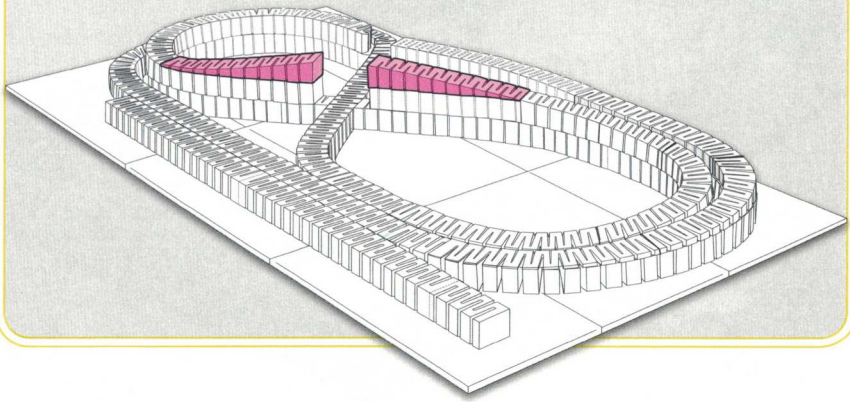
4% STARTER



4% Incline/Decline Starters includes 4 identical 2' sections.

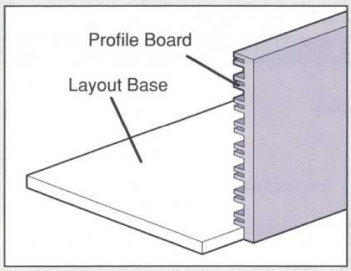


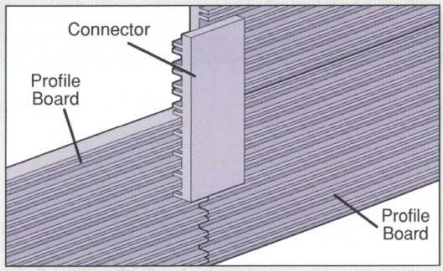
shown with 1" Risers

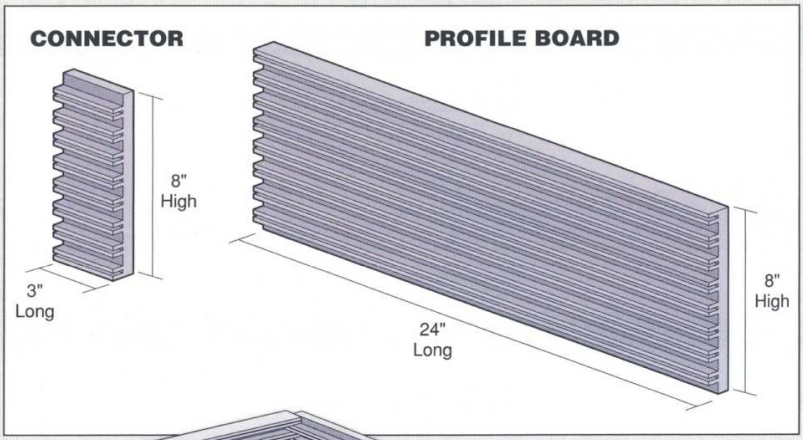


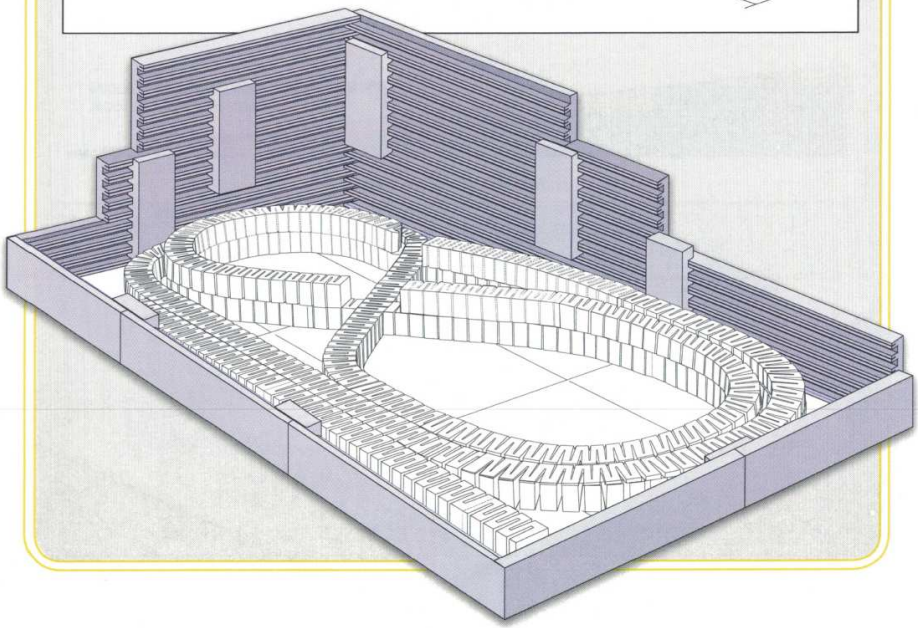
Profile Boards™

Use Profile Boards around the perimeter of the layout to support the terrain surface that you will create later. Profile Boards come with connectors that are used to lock the Profile Boards together for secure assembly. Boards are placed end-to-end or can be stacked to any height. They create a clean edge that can be covered or painted.



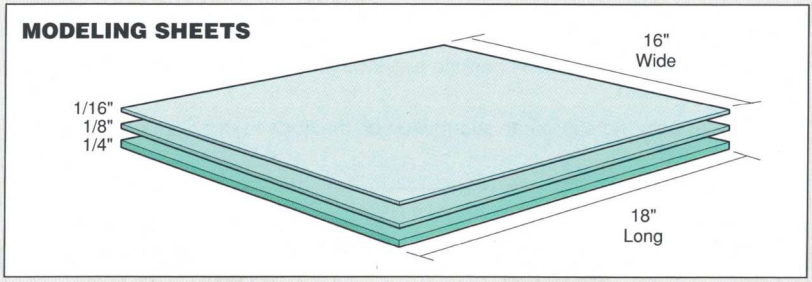


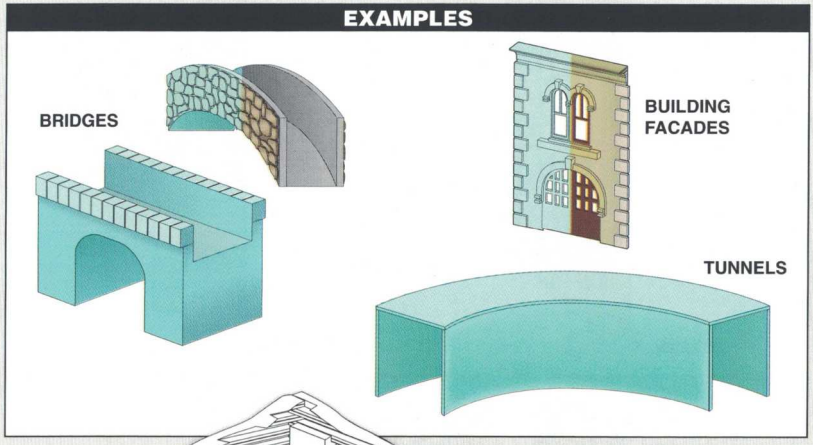


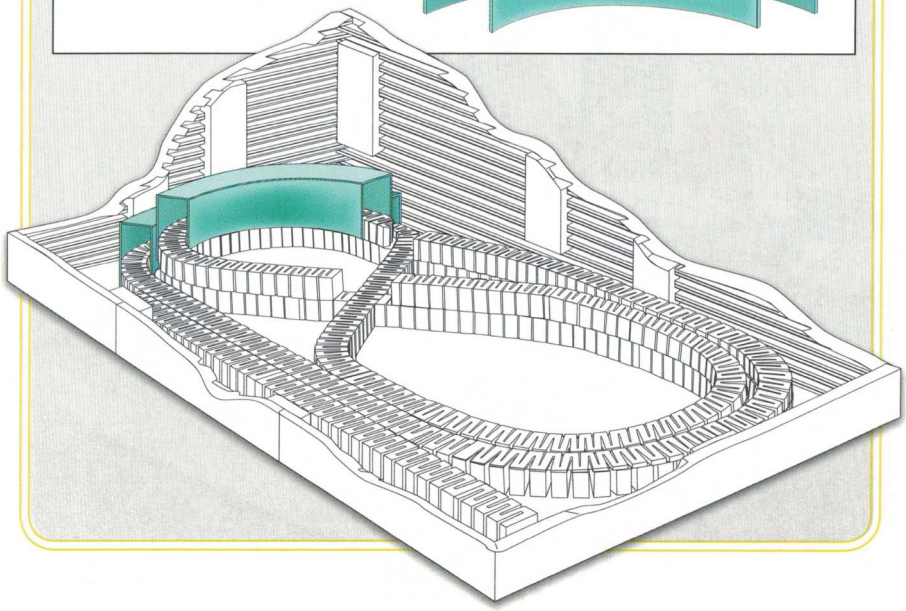


Modeling Sheets

Modeling Sheets are a multi-purpose building material that serve as a lightweight alternative to styrene and balsa wood. They are flexible, easy to cut and the smooth, paintable surface accepts a variety of paints. You can also use Modeling Sheets to add special features, tunnel walls, create flat surfaces for buildings and water areas, make building facades or use for arts and crafts.





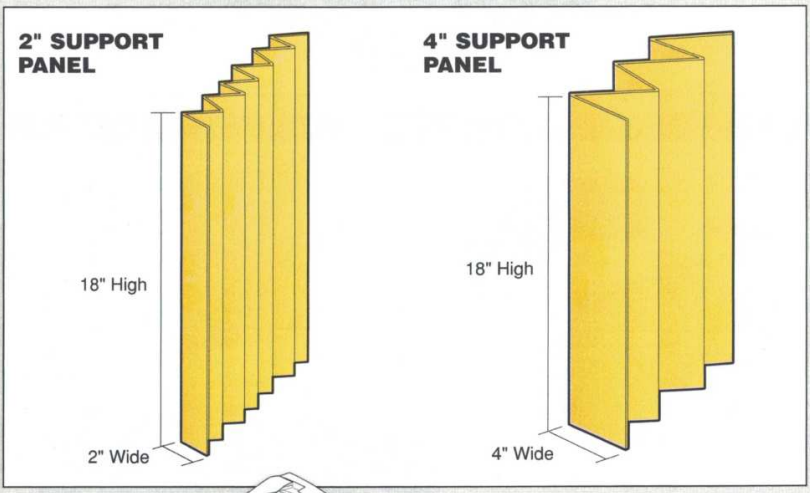


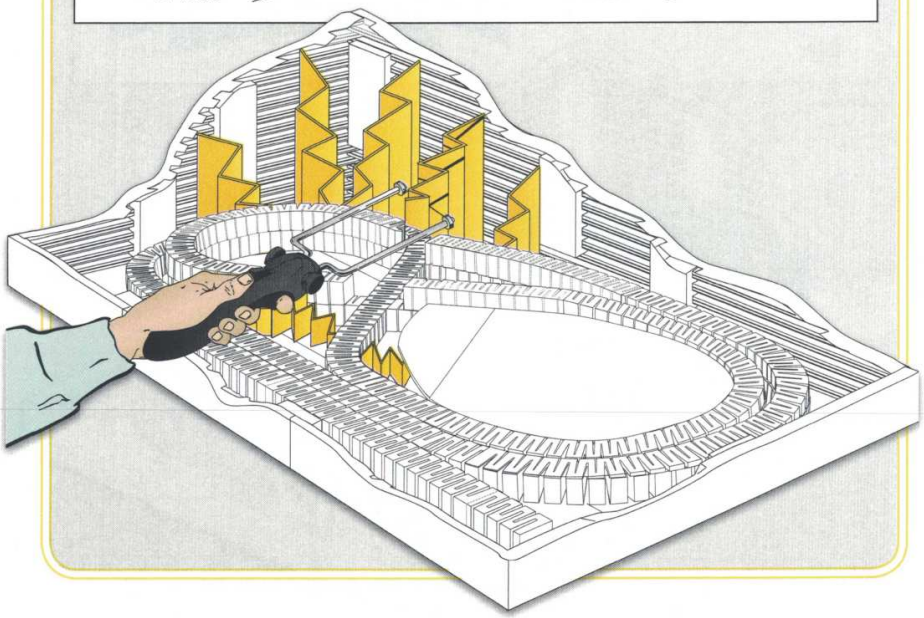
Support Panels

Designed as a strong but lightweight terrain understructure, Support Panels are quick and easy way to create height on a layout. The accordion shape allows them to stretch to cover a large distance quickly.

The 4" Support Panels have a 4" distance between accordion folds and are best for expansive areas where less support is needed. The 2" Support Panels have a shorter distance between folds, allowing for more substantial support. Both versions are 24" long when laid flat. They are ideal for supporting Road Risers when you need a flexible understructure to create elevated hairpin turns like you might find on a mountainous road.

See Chapter 2 for more in-depth information on methods to use Support Panels with the Terrain Shell.

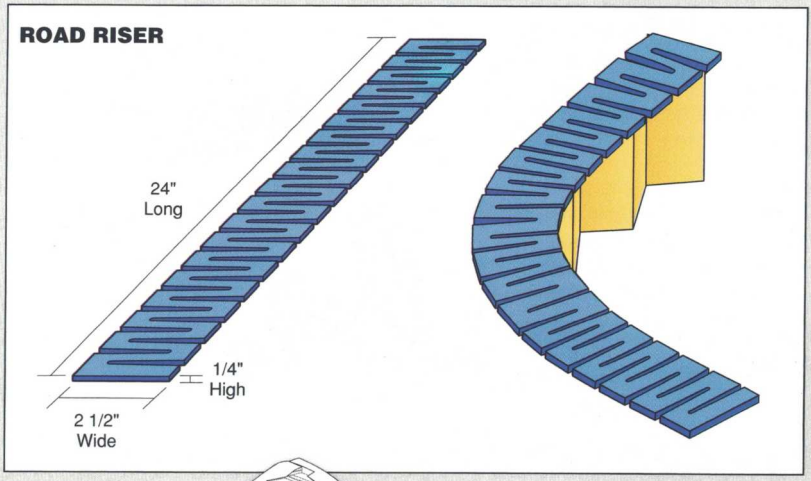


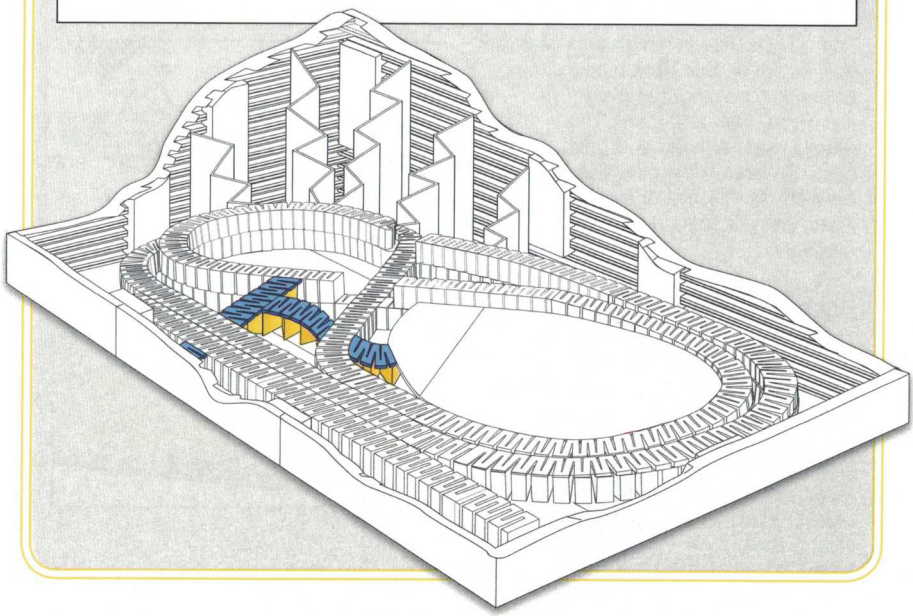


Road Risers™

Road Risers make it easy to add roads and highways to terrain layouts. They are 1/4" tall, 2 1/2" wide, and 24" long. Road Risers are specifically designed to provide an instant flat area for modeling roads. Road Risers flexibility follows the curvature of the terrain much more closely than a thicker Riser, allowing a modeler to create realistic winding and hilly roads. Use Road Risers with Support Panels to create custom grades for roads. To determine how many you will need, simply measure the length of your highways. You will need the same length in Road Risers.

NOTE: Do not use Road Risers in areas that will need to bear weight for a train.



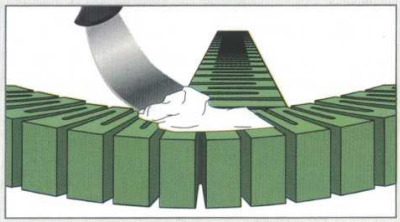


SUBTERRAIN TOOLS & ADHESIVES ONLINE VIDEO

Product Overview

Foam Putty™

Foam Putty is ideal for filling gaps and cracks in foam. This non-shrinking, easily sanded and lightweight filling material has the same characteristics as foam.

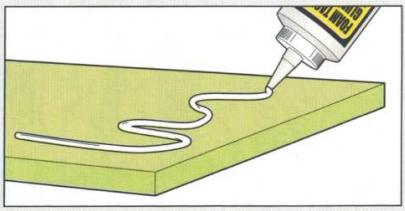


Low Temp Foam Glue

The Low Temp Foam Glue Gun uses Low Temp Foam Glue Sticks. This glue is specially designed to work with SubTerrain and other common modeling and handicraft materials like wood, foam and cork. As the name suggests, this glue gun operates at a lower temperature than ordinary glue guns so it will not melt the SubTerrain foam. The Low Temp Foam Glue will still be hot enough to burn your skin, so you should not spread the glue with your fingers.

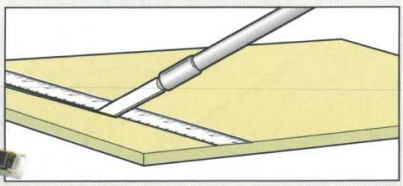
Foam Tack™ Glue

Foam Tack Glue is a high tack glue that is effective on SubTerrain and other common modeling materials like wood, cork and foam. This glue is water-soluble and dries clear. To ensure the glue dries between two pieces of foam, use Foam Tack Glue as a contact cement.



Foam Knife and Blades

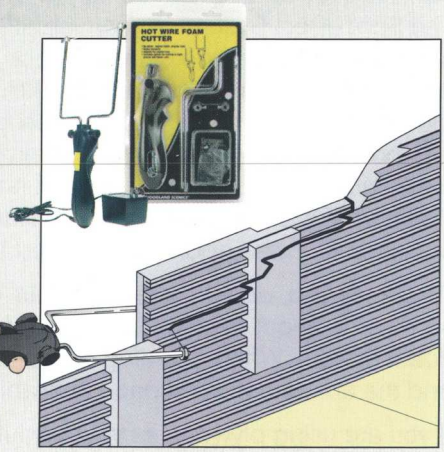
The Blade on the Foam Knife is longer than a typical hobby knife. This makes the Foam Knife easier to use when building with SubTerrain foam components. The Foam Knife comes with a 2" replaceable Blade ideal for cutting thick pieces of foam.



Hot Wire Foam Cutter

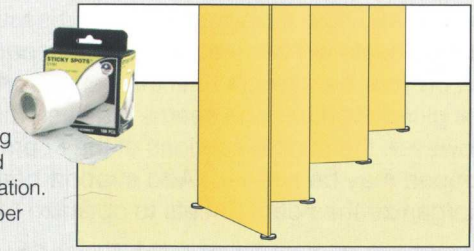
The Hot Wire Foam Cutter comes with a Nichrome wire that heats up and maintains an even temperature so it cuts through foam quickly. Adjustable collars allow for accurate cuts in different heights and angles. To create more versatile, precise and angled cuts, use the Foam Cutter Bow & Guide. This attachment to the Hot Wire Foam Cutter makes beveling and specialty cuts a breeze.

Note: To avoid the emission of toxic fumes, use the Hot Wire Foam Cutter only on Woodland Scenics foam products. Use in well ventilated area.



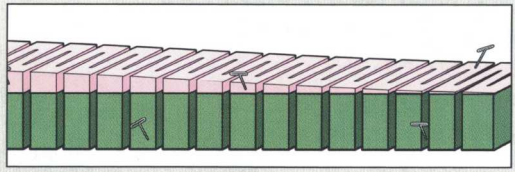
Sticky Spots™

Sticky Spots are a high-tack, round-shaped, multi-sided adhesive that yields instant placement on smooth and textured surfaces. They are repositionable and leave no residue. Sticky Spots are perfect for positioning Support Panels, Modeling Sheets and Road Risers before permanent installation. They can also be used to attach Shaper Sheet (page 61) to Profile Boards.



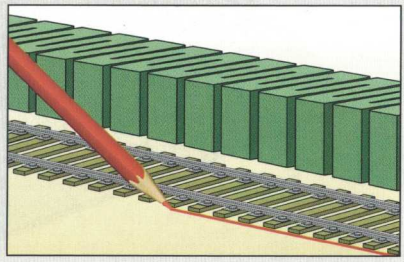
Foam Nails

Foam Nails are 2" long and are used to temporarily pin track, foam and other products to your layout.



Foam Pencils

Foam Pencils have special lead and are designed to draw on foam without causing damage. The colors will not bleed through paint or other coverings. Each package contains two red and two black pencils.



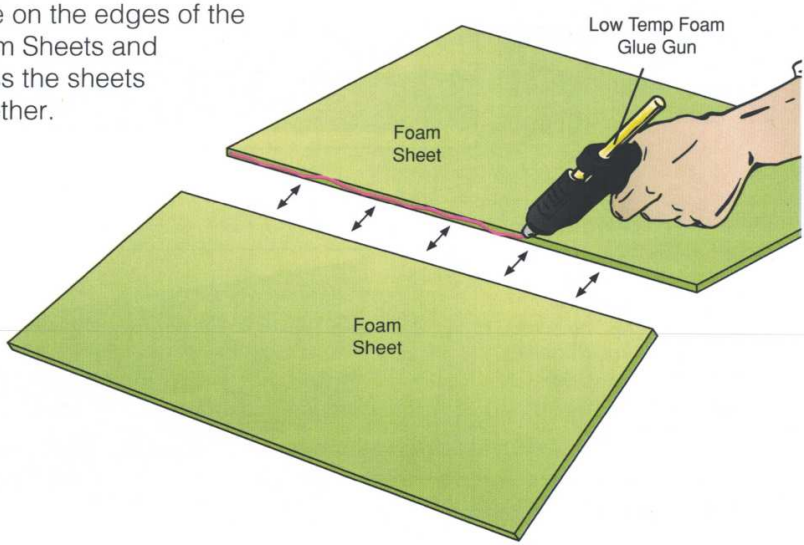
CREATE A LAYOUT BASE

The SubTerrain System is very versatile and can be constructed on almost any size or type of layout base. The layout base should be flat, cover the benchwork, and be firm enough to hold the weight of the model. Many models are built on layout bases made of either plywood or Foam Sheets. We recommend using Foam Sheets that are a minimum of 1/2" thick. For a plywood base, try a 5/8" thick, grade AC plywood. If the model will bear substantial weight, use thicker base materials or install additional support beams in the benchwork.

To get started, decide what size your layout will be and create the same size layout base by cutting plywood or assembling sections of Foam Sheets. When deciding the size of your layout, consider scale and the amount of workspace available to you.

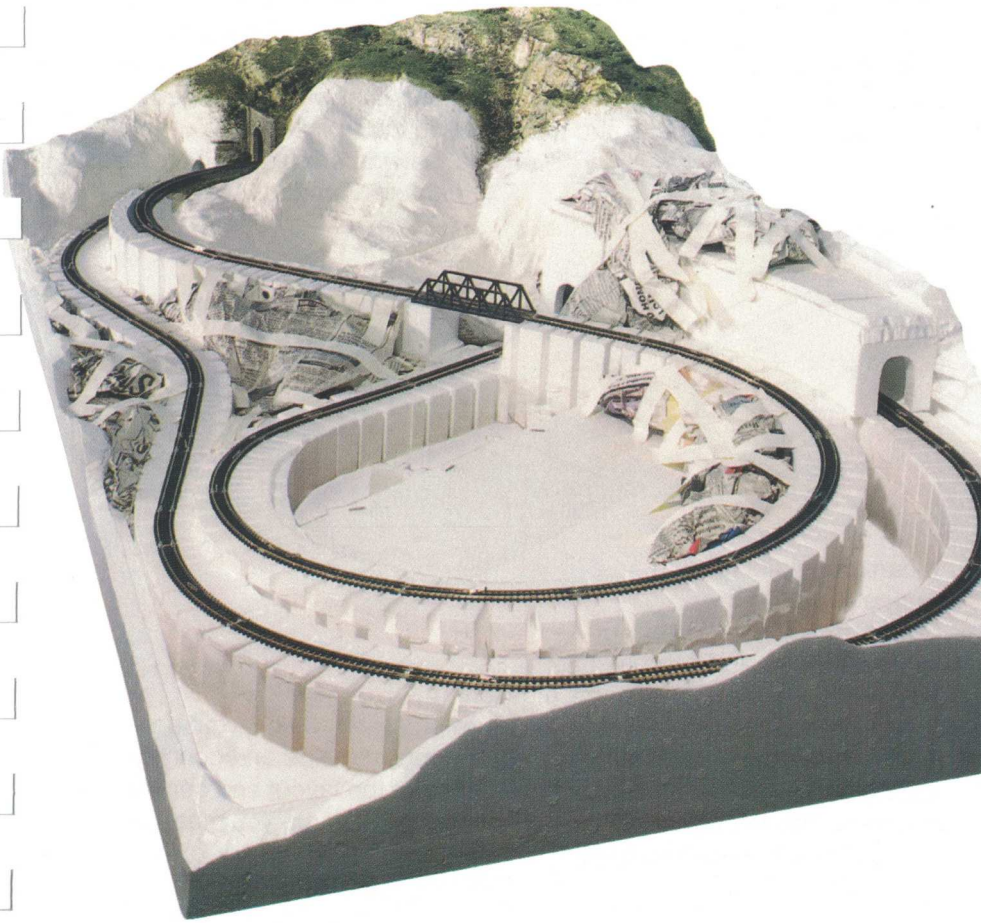
If you are using plywood as your layout base, cut pieces of plywood to size and secure the plywood to the benchwork. If using Foam Sheets for your layout base, determine how many Foam Sheets are needed to create the size of layout you need. Measure the total length and width of the layout. Draw a diagram with the measurements and count how many Foam Sheets will be needed to fill the space. Then, lay the Foam Sheets out on your benchwork until the benchwork is covered. Once the sheets are glued together, the seams between the sheets will be very strong. However, the middle sections of the Foam Sheets are where additional support may be needed. Add support beams to the benchwork, or reorganize the Foam Sheets to optimize the benchwork support.

To make a modular layout with Foam Sheets, mark the foam where each module will begin and end. Once the Foam Sheets are arranged as desired, glue the ends of the Foam Sheets together. Spread Low Temp Foam Glue or Foam Tack Glue on the edges of the Foam Sheets and press the sheets together.



Secure the seam between Foam Sheets with Foam Nails while the glue is drying. When the sheets are pressed together, the glue may squeeze out of the seam and leave a ridge on the surface. Use a craft stick to smooth the excess glue. If you do not smooth the excess, the ridge will cause problems later when installing Risers and other SubTerrain components. See page 56 to use Foam Tack Glue as a contact cement for an instant bond. Allow the glue to dry thoroughly. After the glue has dried, cut any excess foam that overhangs the benchwork with the Hot Wire Foam Cutter or Foam Knife.

TIP! Please note all other SubTerrain Foam components should be assembled, pinned in place and tested before they are glued together. **Model Railroaders—do not glue until you have tested your track!**



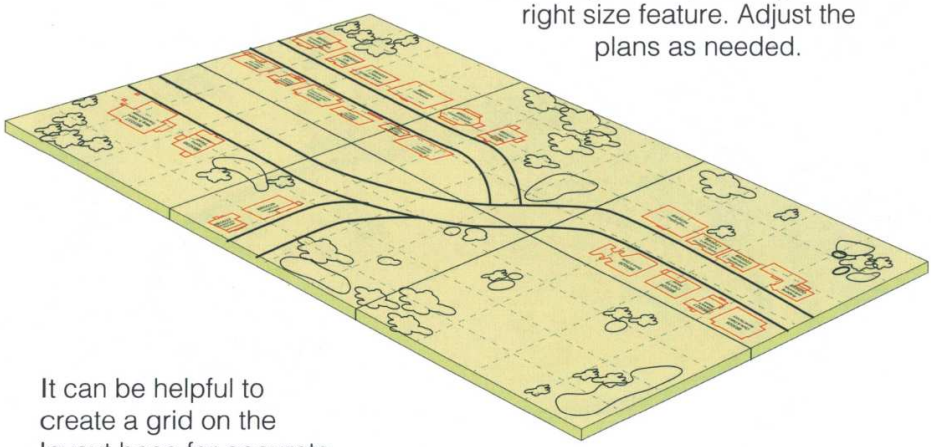
TRANSFER LAYOUT AND TRACK PLAN TO BASE

Once your layout base has been built, you are ready to transfer your layout and track plans onto the layout base.

Drawing the track and layout plans on the layout base will help you position the SubTerrain foam components. It is also an opportunity to check that your measurements are accurate, that the plan will work in the amount of space you have available, and to make adjustments as needed.

PLANS WITHOUT TRACK

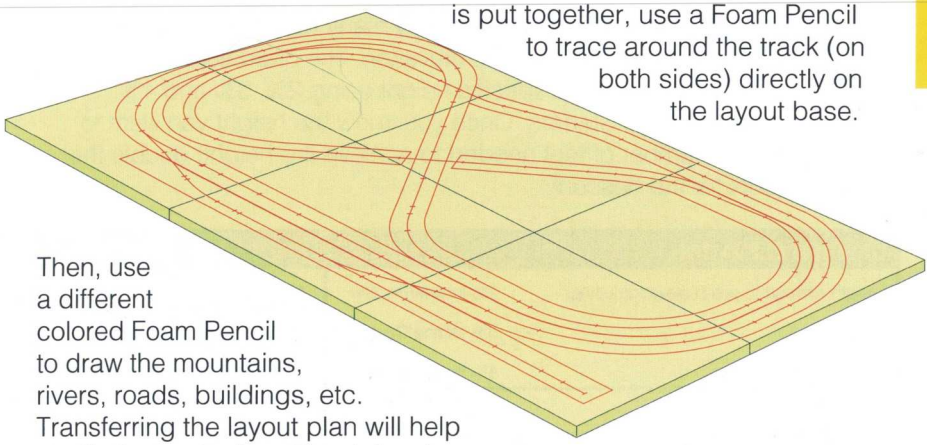
If your plans do not include railroad tracks, simply transfer the layout plan you have already sketched (page 17) directly onto your layout base. Use Foam Pencils to draw the plans onto the layout base. Use one color for structures/roads, and a different color for bodies of water, mountains or other features. Color coding the features will help you identify what should go where. Label the features as needed. You can temporarily place buildings and other features that will be installed directly on the layout base and trace around them. This way you ensure that you are planning for the right size feature. Adjust the plans as needed.



It can be helpful to create a grid on the layout base for accurate measurements and placement of features. To make a grid, use a measuring tape to make evenly spaced gridlines on one side of the layout base. Then, make evenly spaced marks on the opposite side and connect the lines. Repeat this on the other two ends of the layout and connect the lines. This will leave a perfectly spaced grid to help you measure the distance between features.

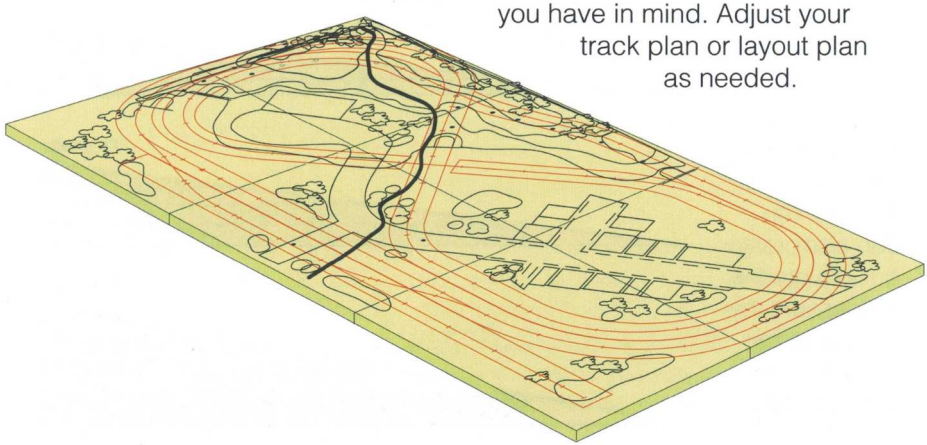
PLANS WITH TRACK

If you are a model railroader, it is time to put the track plan and layout plan together on the layout base. Transfer the track plan to the layout base first. Assemble your track and lay it on the layout base according to the track plan. Temporarily pin the track in place with Foam Nails. The track sections should be butted together tightly. Once the track is put together, use a Foam Pencil to trace around the track (on both sides) directly on the layout base.



Then, use a different colored Foam Pencil to draw the mountains, rivers, roads, buildings, etc. Transferring the layout plan will help clarify the track plan. Check for clearance issues where features meet the track plan and adjust any features that interfere. If needed, add tunnels or overpasses to the track plan. Consider how your train will go over hills. You will need to build up the height of the track gradually so it can go over the hill.

Grade is the degree of elevation change between two points over a specific distance. The percentage of grade affects whether or not your train can pull its weight up the hill or mountain that you are planning to build. Unlike automobiles, trains cannot gain elevation rapidly. Choose a grade for your track based on the amount of space that you have on your layout and whether your train can handle the grade. Check with the train manufacturer to ensure the train is compatible with the grade you have in mind. Adjust your track plan or layout plan as needed.



CHOOSING A GRADE

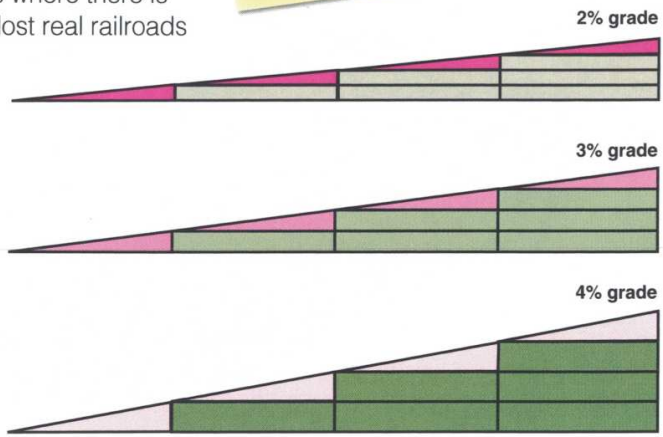
When choosing a grade, consider the length and space needed to create the desired effect. Determine how many feet it will take to reach the desired height and whether that height can be achieved on your layout. SubTerrain Incline/Decline Sets and Starters are designed to model specific grades without any complicated calculations. They make it easy to plan for a grade.

Reference the chart below to determine how many feet of track is needed to reach and descend from a specific elevation. The chart shows how many feet it takes to achieve a specific height using 2%, 3% and 4% Incline/Decline Sets and Starters. Once you know the height you want to achieve and the number of feet needed to achieve the height, double the measurements for the descent.

DESIRED ELEVATION		1"	2"	3"	4"	5"	6"
Length needed to reach elevation using:	2% Incline/Decline	4'	8'	12'	16'	20'	24'
	3% Incline/Decline	3'	6'	9'	12'	15'	18'
	4% Incline/Decline	2'	4'	6'	8'	10'	12'

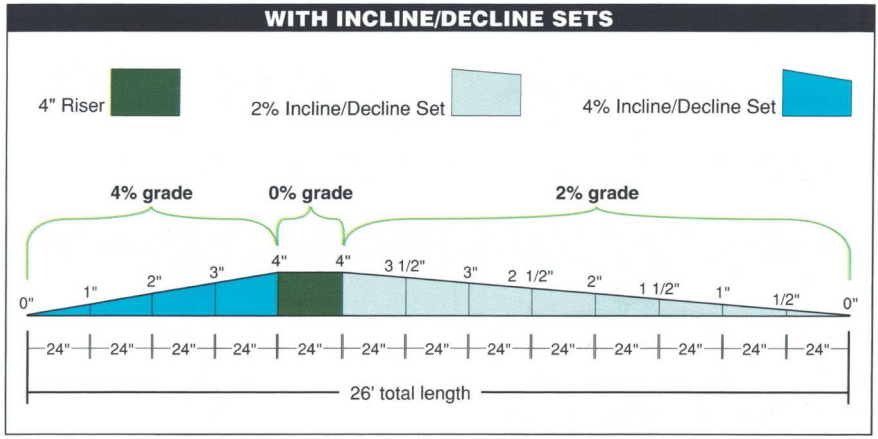
A 4% grade is ideal for many model railroads. Although this is steeper than most real railroads would use, it allows for interesting changes in elevation over a short distance and helps when selectively compressing large geological features onto your small layout. If you have a small space, but want the realism of a grade, use a 4% grade. Smaller grades like 2% or 3% are better for less dramatic terrain like prairies where there is moderate relief. Most real railroads have 2% or 3% grades, but they require more space on model railroad layouts. You can also create custom grades. Just ensure the custom grade is not too steep for your train.

TIP! Please note that if the track must level out for features like bridges and turnouts, this will add to the overall length of the incline or decline. Measure these on your layout base and include the number in the overall length.

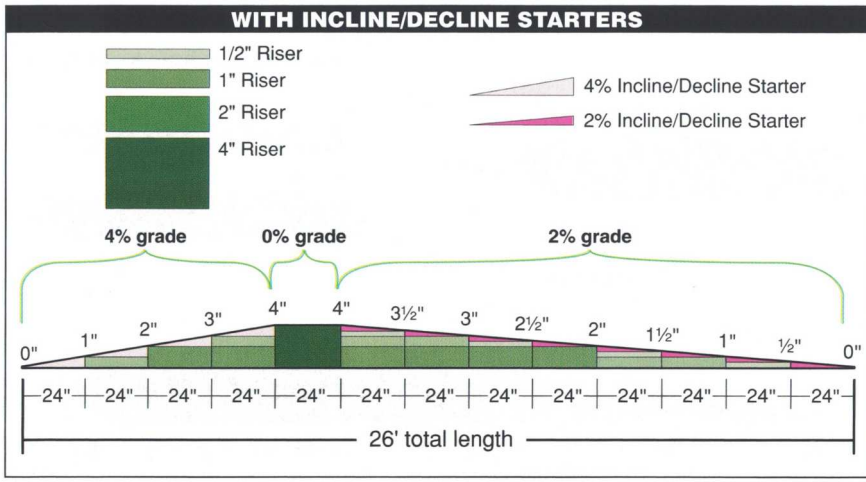


CREATING GRADES

Incline/Decline Sets make it easy to create grades. Just stack the sections of your Incline/Decline Set on top of Risers or your layout base. Many train tracks and roads climb and descend at two different grades due to naturally occurring terrain variations. For realism, make the model's decline grade different than its incline grade. You can also alternate grades with Starters, adjust the length of Sets, change grades mid-incline or combine Sets and Starters to get any elevation. Learn about these techniques on the next few pages. The illustration below shows how to use a 4% and 2% Incline/Decline Set to create a 4% grade and 2% grade over 26'.



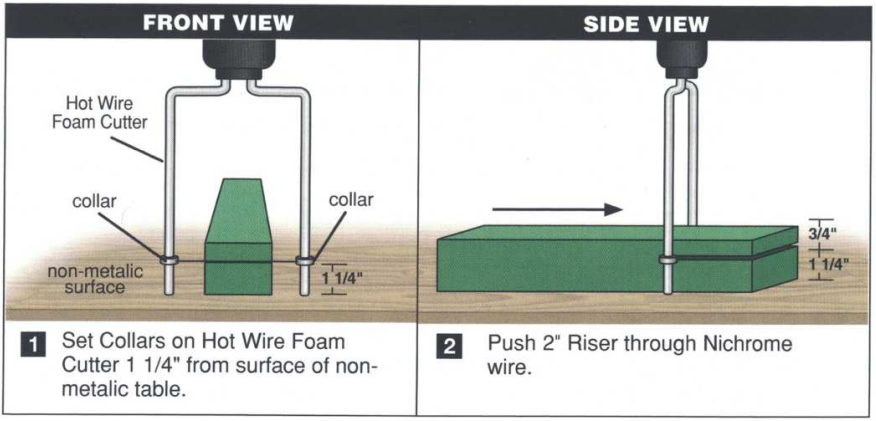
Incline/Decline Starters can create the same effect, but must be used in combination with Risers. The illustration below shows a 4% and 2% grade created with a combination of Risers and Incline/Decline Starters over 26'. However, Incline/Decline Starters are intended to be used to create custom grades as discussed on the following pages 42-44.



Alternate Grades with Starters

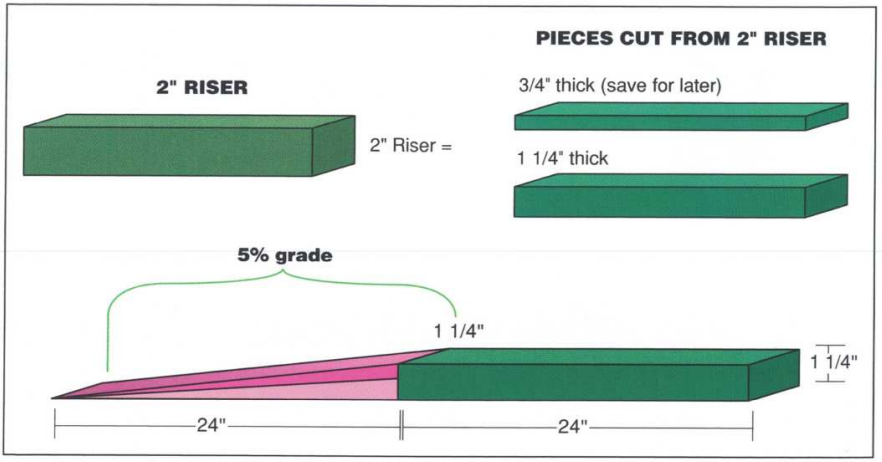
A benefit to using Incline/Decline Starters with Risers is that you can build grades other than 2%, 3% or 4%. The illustration below shows how you can stack Starters to create steeper grades. When you do this, you may end up with a height that does not match a specific Riser height. For example, if you want a 5% grade, stack a 2% and a 3% Starter to create a 5% grade. This makes the incline end at a total height of 1 1/4". No Riser is 1 1/4", but a 2" Riser can be cut to a 1 1/4" height. Use the Hot Wire Foam Cutter to cut the Riser, see illustration below.

NOTE: *No Riser is 1 1/4" high. To match this height, modify a Riser by cutting it lengthwise as shown below.*



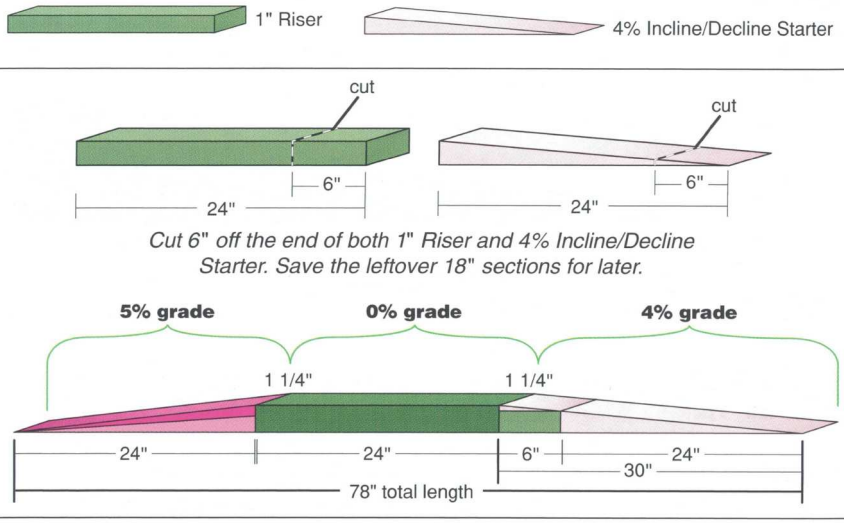
1 Set Collars on Hot Wire Foam Cutter 1 1/4" from surface of non-metalic table.

2 Push 2" Riser through Nichrome wire.



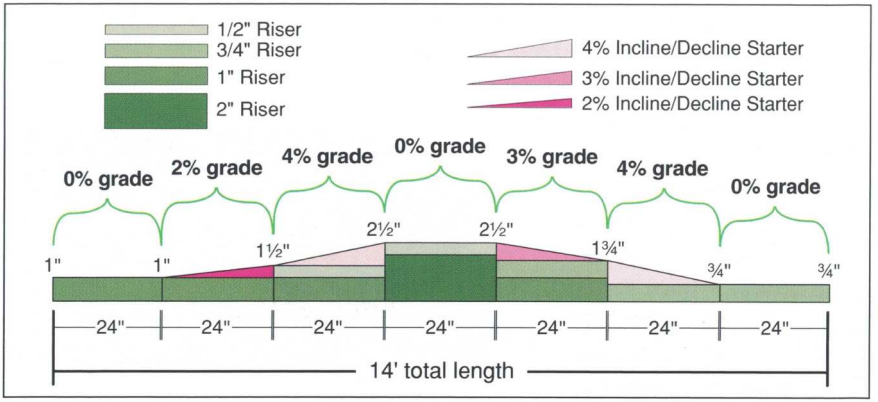
Adjusting Length

Sometimes the available space on a layout does not perfectly fit the length of an Incline/Decline Set, Starter, or Riser. Any of these pieces can be cut to fit your needs. For example, perhaps you want a 5% grade that levels out and then descends at a 4% grade over 30 inches. Starters only come in 24 inch increments, so that leaves 6 extra inches to fill for a smooth Incline/Decline. To achieve this, cut 6" off the tip of a 4% Starter and cut 6" off the end of a 1" Riser. Stack the cut pieces together and butt against the full Riser and 4% Starter.



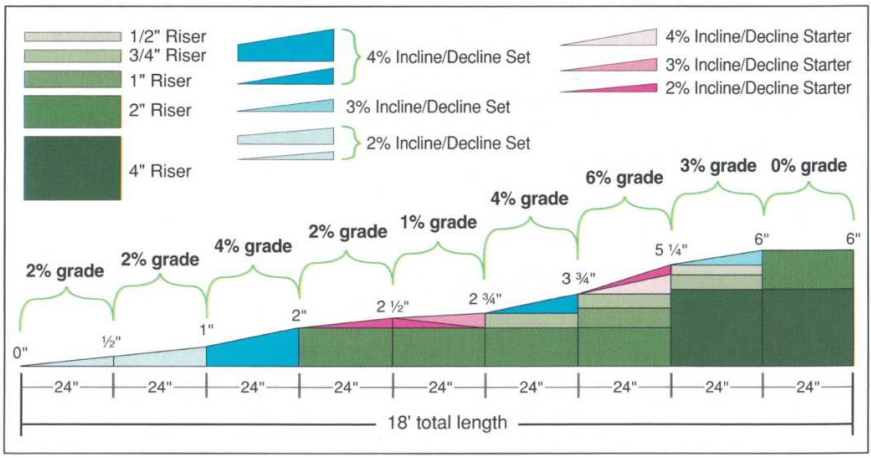
Changing Grades Mid-Incline

Another benefit to using Incline/Decline Starters is that you can change the percentage of grade in the middle of an incline or decline. The illustration below shows a 2% grade changing to a 4% grade, leveling out and then descending at a 3% and then 4% grade. This allows for a truly realistic height gain.



Rise to Any Elevation

Use a combination of Risers and Incline/Decline Sets and Starters in a stair-step fashion to obtain any elevation as shown in the illustration below. You can even create a 1% grade by stacking a 3% and 2 % Starter in opposite directions.



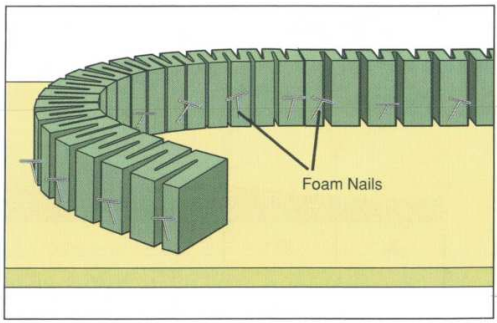
INSTALLING SUBTERRAIN ONLINE VIDEO

The most important rule of installation is to test before you glue. Testing your track will be discussed at the end of the chapter. Pin your pieces in place as you go with Foam Nails. Test your layout once everything is pinned in place.

INSTALL RISERS

Begin installation with Risers. Center Risers over the track outline drawn on your base. Butt the Riser sections together. Pin the Risers to the base with Foam Nails. Space Foam Nails 8-10" apart on straight sections and outside curves. For tighter inside curves, space Foam Nails 4-6" apart.

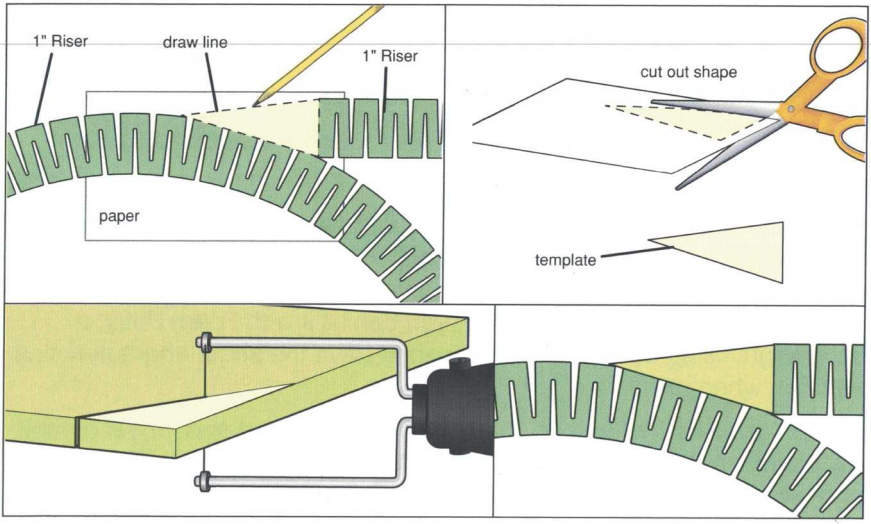
When cutting Risers to fit together end to end, an exact fit is not necessary. Small gaps between Risers will be covered later with Plaster Cloth and Track-Bed (page 46). Gaps can also be filled with Foam Putty. Note that Risers installed around a curve may tend to lift up on the inside edge. Pin these firmly in place.



If your plan calls for bridges, leave the correct space between Risers for each bridge. Check the manufacturer's instructions for each bridge, or review the Bridges section (page 53).

DIVERGING RISERS

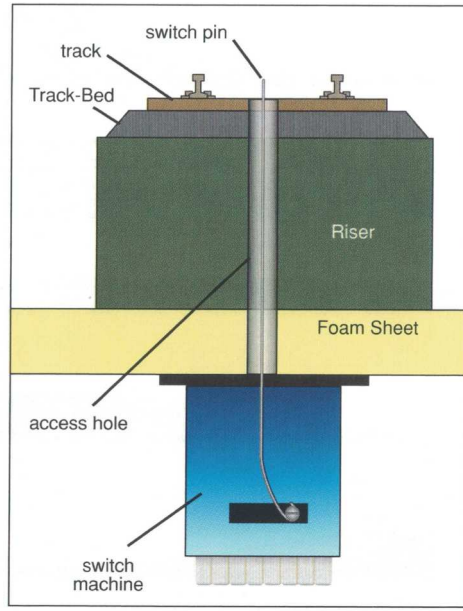
Your plan may have several loops and include features such as crossovers, intersections, turnouts and overpasses. There will be triangular gaps between Risers when creating these features. These gaps can be filled using a solid block of foam or a thinner piece supported with smaller scraps.



SWITCH MACHINES

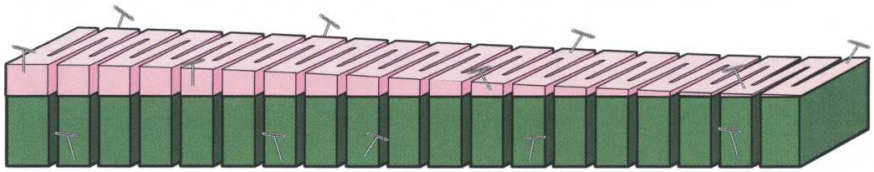
Switch machines allow a modeler to change the position of the track for a switch or turnout. They are available in a wide variety of styles and installation will be different depending upon the style. Always check the manufacturer's instructions before installation.

Typically, the switch machine will need to be attached to a piece of Masonite that has a slot notched in it for the switch pin to reach the track and move back and forth. The Riser or Foam Sheet that the track rests on will need to be notched to fit the Masonite and the layout base will need a hole cut into it for access from under the layout. Take a look at the illustration to the right for an example of how to install a common style of switch machine. Most switch machines will be easier to install when you are installing your Risers.



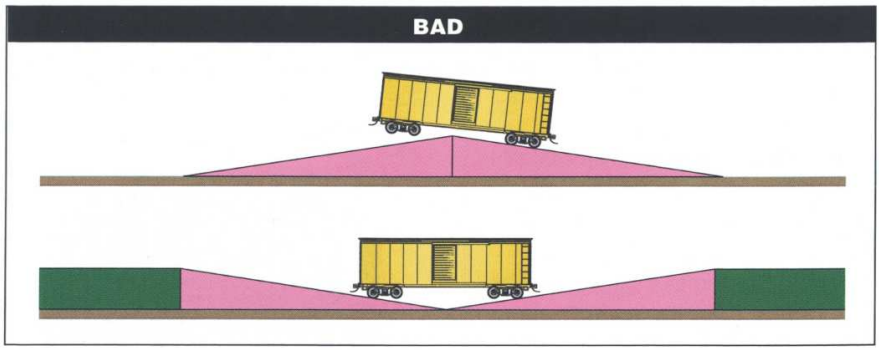
INSTALLING INCLINES/DECLINES

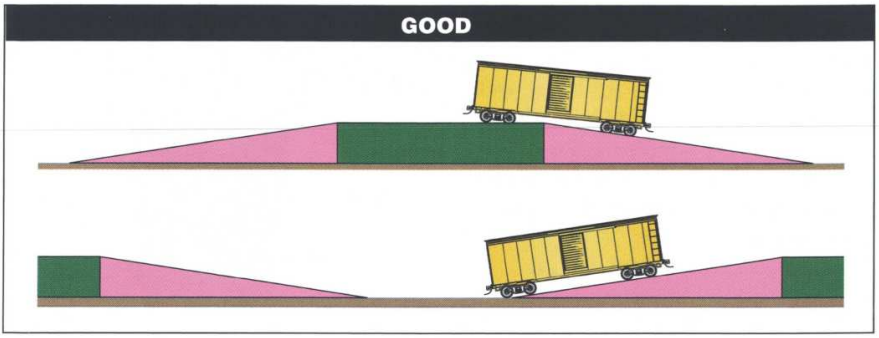
Center the Inclines/Declines on top of the Risers and pin them to the Risers with Foam Nails. As with Risers, you may need to cut Inclines/Declines to fit. Use your Hot Wire Foam Cutter or Foam Knife.



Where an Incline/Decline Starter or the first piece of an Incline/Decline Set meets a Riser, there may be a small ridge or bump. This is usually not a problem as it will be smoothed over later with Plaster Cloth. If you are concerned about the gap, you can fill it with Foam Putty, a lightweight filling compound designed to have the same characteristics as foam when dried.

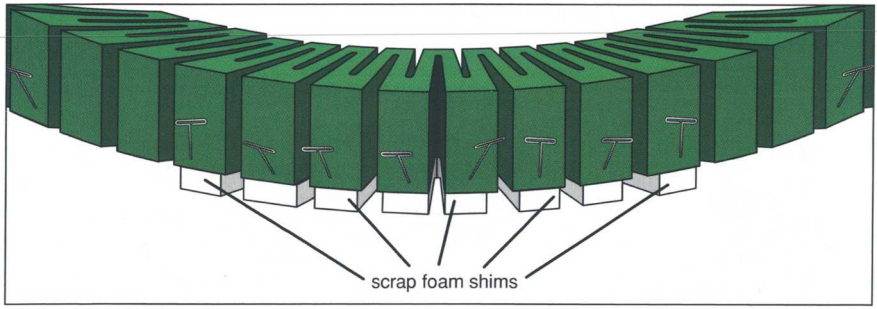
Do not install an Incline and Decline so their tapered ends meet or their thick ends meet. The angle is too difficult for train wheels to maneuver and will cause derailment. Foam Putty will not fix this. Always allow a level space between an Incline and Decline for proper train function. Make sure the flat space is at least the same length as your longest piece of rolling stock to prevent derailment.





BANKING RISERS AND INCLINES/DECLINES

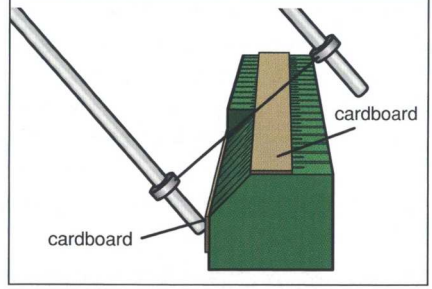
Real roads and railroads are often banked slightly on curves. Some modelers choose to bank their layout's roads and track to enhance realism. Insert shims under Risers or Inclines/Declines around the outside of curves. These shims will be glued in place after testing your layout.



TRIMMING RISERS, INCLINE/DECLINE SETS AND STARTERS ONLINE VIDEO

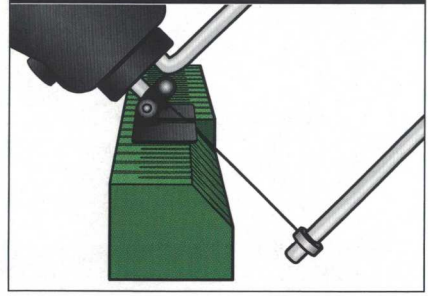
Trimming Risers and Inclines/Declines should not be necessary unless their position interferes with pre-existing landscape features, such as gullies or mountains. This should only occur if you are building on an existing layout, which already has terrain features installed. If it is a tight fit for a Riser, it is likely to be a tight fit for your train. Be sure to test before committing glue to the layout. However, if interference occurs, you do have some leeway to modify Risers and Incline/Decline Sets and Starters.

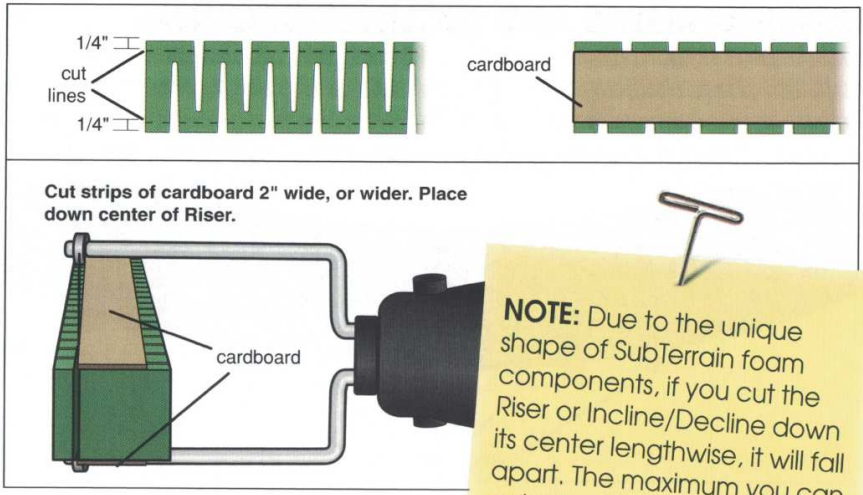
USING HOT WIRE FOAM CUTTER WITH STRIPS OF CARDBOARD



Risers and Inclines/Declines can also be beveled at the top to provide a narrower surface for laying track. This can be especially useful for N scale modelers and creating gullies and ditches along the track side. Cut bevels prior to installing foam. If you plan to do a lot of beveling, try the Bow & Guide. Attach the Bow & Guide to your Hot Wire Foam Cutter. Set the angle of the guide to the angle of the desired bevel.

USING HOT WIRE FOAM CUTTER WITH FOAM CUTTER BOW & GUIDE





BUILD STREETS AND ROADS

A realistic layout needs streets and roads leading to the industries, towns and other buildings. Roads can have more dramatic grades and turn or bank more sharply than tracks. They can be included almost anywhere. If you want a steep incline leading directly into a deep decline, roads are where you can do this.

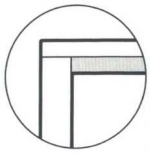
Building roads is easy. Use any combination of Risers, Incline/Decline Sets and Incline/Decline Starters in the same manner as they are used to support track. Place two Risers side-by-side to make wider roads if desired. If the roads on your layout bear no significant weight, they may be suspended and supported with pieces of scrap foam. If you are using Road Risers, use 2" Support Panels and Sticky Spots to elevate your roads. Later, streets and roads will be covered with Plaster Cloth and paved with the Road System (pages 93-100).

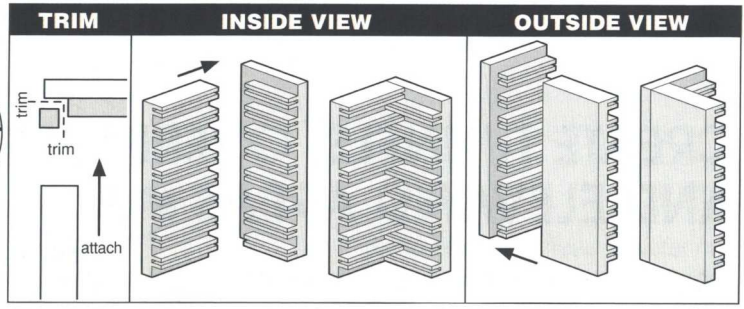
INSTALLING PROFILE BOARDS ONLINE VIDEO

Profile Boards are designed to interlock at corners by turning the adjoining boards upside down. Pin the Profile Boards to the base with Foam Nails. For a seamless joint, the Profile Boards can be cut at a 45° angle (mitered) at the corner using the Hot Wire Foam Cutter with the Bow & Guide attachment. If your corners are not mitered, cut 1/2" x 1/2" strips from Profile Board scrap. Fill the void at each corner where the Profile Boards meet and trim to the height of each corner. You can also notch the corners of the Profile Boards for a flush fit.

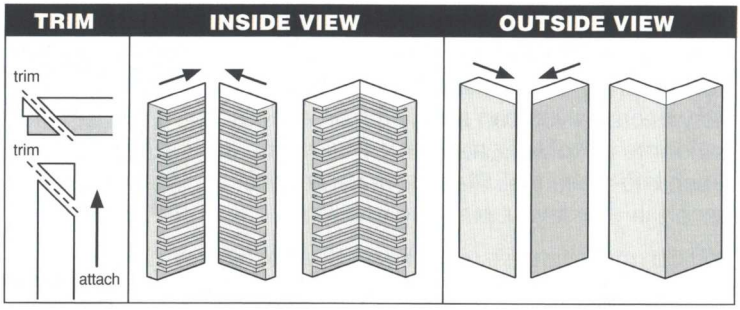
Profile Boards may extend past the end of the base. If this happens, trim the end of the Profile Board with the Hot Wire Foam Cutter or Foam Knife. Use a straight edge to ensure a straight, square cut.

Notched Corner

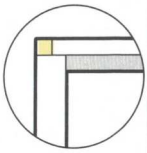


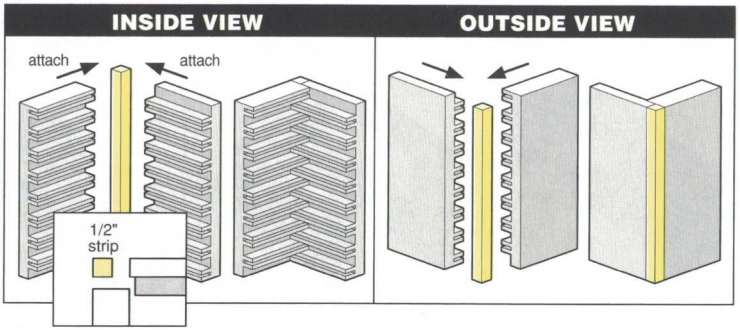


Mitered Corner



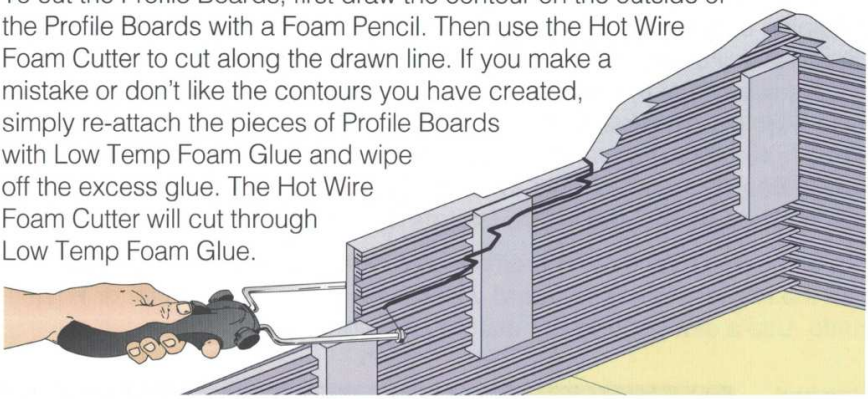
1/2" Strip Corner





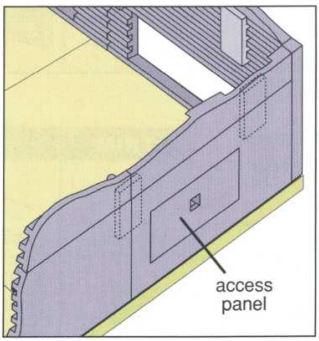
CUT CONTOURS

To cut the Profile Boards, first draw the contour on the outside of the Profile Boards with a Foam Pencil. Then use the Hot Wire Foam Cutter to cut along the drawn line. If you make a mistake or don't like the contours you have created, simply re-attach the pieces of Profile Boards with Low Temp Foam Glue and wipe off the excess glue. The Hot Wire Foam Cutter will cut through Low Temp Foam Glue.

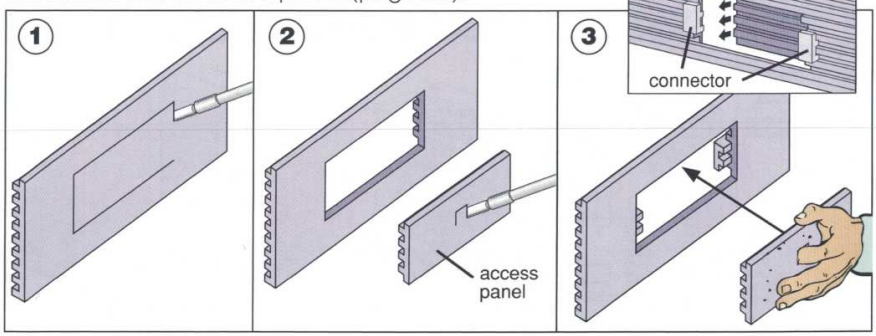


CREATE TUNNELS, OVERPASSES AND ELEVATED AREAS ONLINE VIDEO

Tunnels are useful features on layouts because they create a view block where the train can disappear and reappear. Before creating a Tunnel, consider a couple of things. For cleaning and derailments, you need a way to access the track within your tunnel. The SubTerrain system makes creating this access easy because you can simply cut an access panel into a Profile Board that will allow you to reach into the tunnel. Plan to create access panels in your layout planning phase.

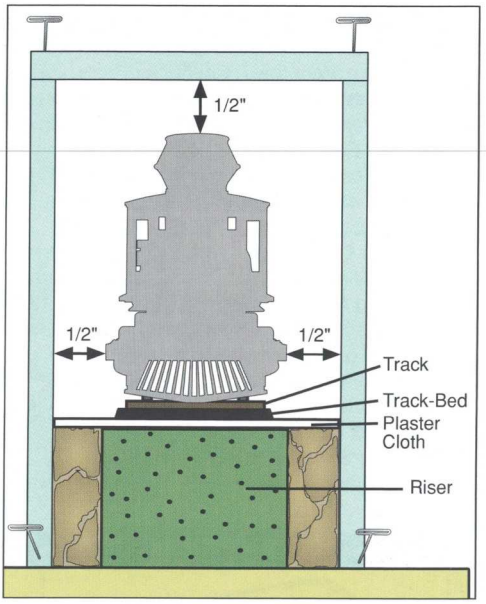


You can make tunnels out of Foam Sheets, Modeling Sheets, Tunnel Liner Form or Shaper Sheet. Using Shaper Sheet for terrain contours, like tunnels, will be discussed further in Chapter 2 (page 69).

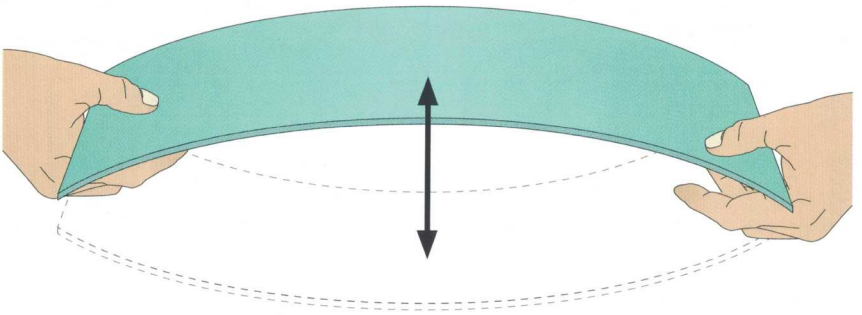


TUNNELS WITH FOAM SHEETS AND MODELING SHEETS

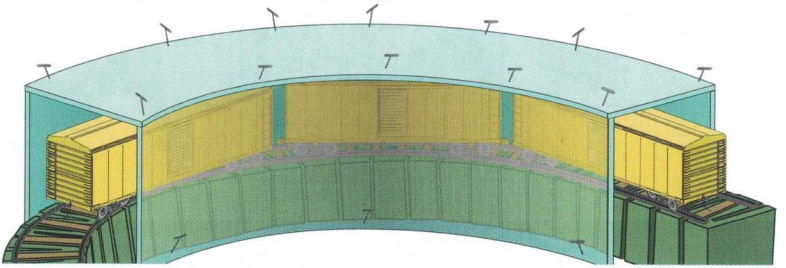
Cut Foam Sheets to form tunnel sides and ceilings. These will support terrain contours and keep the track area clear. Pin the foam in place with Foam Nails. To ensure adequate clearance between tunnel sides and track, place the walls at least 1/2" away from the Risers. Allow 1/2" in height for the track and Track-Bed (page 76) to be installed. Use scrap pieces of 1/2" foam as spacers.



If your tunnel curves, you will need to bend the tunnel wall, creating a vertical curved area. Cut a 1/4" Foam Sheet or any size Modeling Sheet to the desired height. Gently flex the foam back and forth. You will hear it "give" as you flex it. When testing your layout, check for clearance to make sure there are no problems when a train goes through the tunnel.

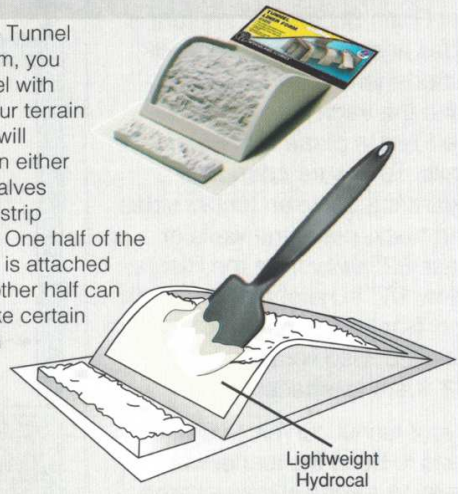


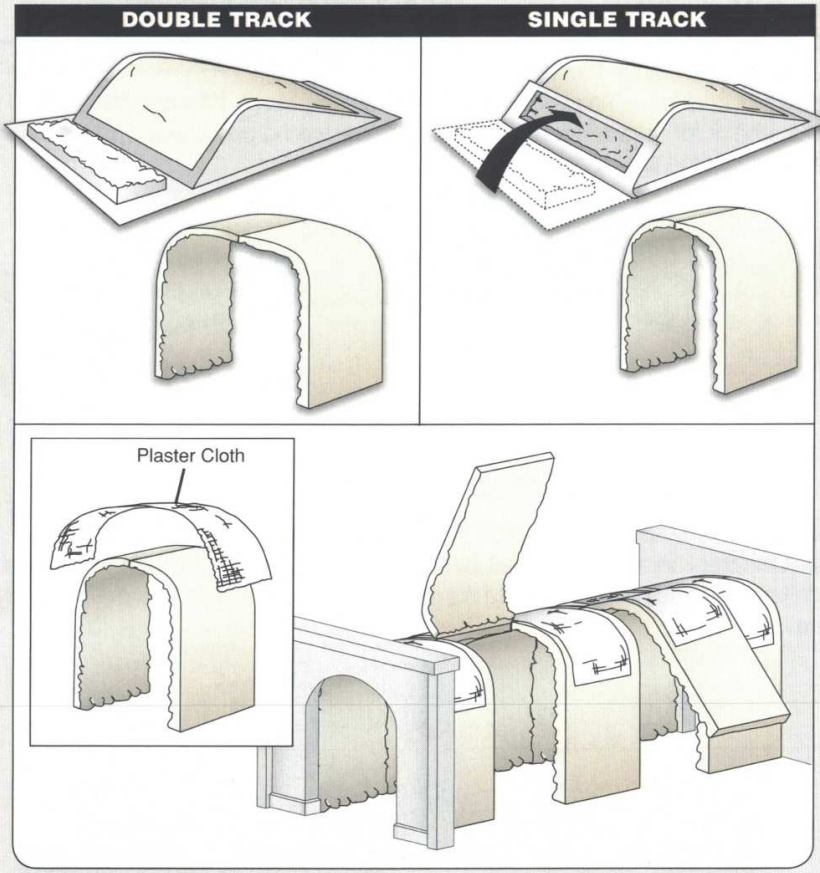
Before permanently attaching the tunnel sides and ceiling, you will need to install the track in areas covered by the tunnel. Chapter 2, Terrain, will cover installation of track in tunnels. Be sure to read ahead before you permanently install your track.



Tunnel Liner Form

Another tunnel formation option is the Tunnel Liner Form. With the Tunnel Liner Form, you can create plaster castings of a tunnel with realistic texture that will blend with your terrain features. Each casting from the form will produce one half of a tunnel section in either single or double track width. These halves are then connected on the top with a strip of Plaster Cloth, which forms a hinge. One half of the tunnel will remain stationary. This half is attached directly to the terrain base while the other half can be raised for repairs to the track. Make certain you have a way to access the section of the tunnel that opens. Use the Tunnel Liner Form with Lightweight Hydrocal® Plaster, Shaper Sheet Plaster or Super Strength Plaster (pages 62-63).



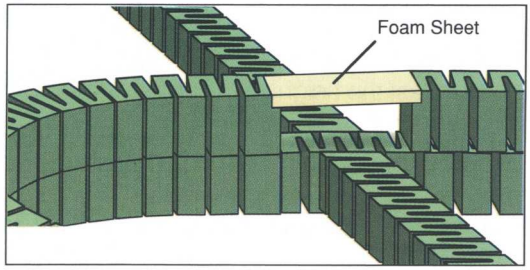


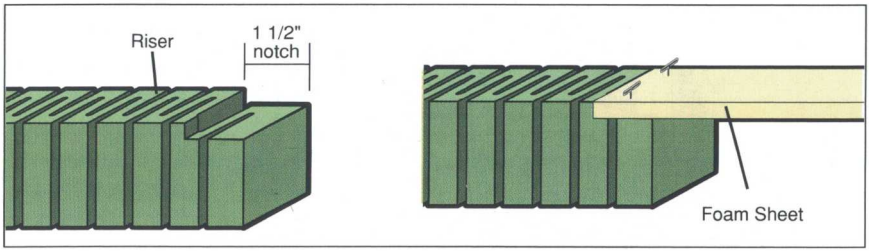
OVERPASSES

A layout may call for track or roads to pass over or under each other. If your layout calls for this kind of overpass, keep in mind that you will need adequate clearance both horizontally and vertically. The amount of clearance will depend upon the scale of your layout. Check trains or vehicles that will pass through. Inclines/Declines (4") are the ideal height for an HO scale layout overpass.

When creating an overpass it is important to adequately support the upper track or road. Use at least 1/2" Foam Sheets for the upper support. If the gap is large you may wish to use thicker foam for proper support. Cut a piece of Foam Sheet 2 1/2" wide (the width of a Riser) and 3" longer than the length of the opening.

Now cut notches in the tops of the Riser at either end of the overpass. These notches should be 1 1/2" long. Nestle the Foam Sheet into the opening on the Risers and pin in place.





BRIDGES

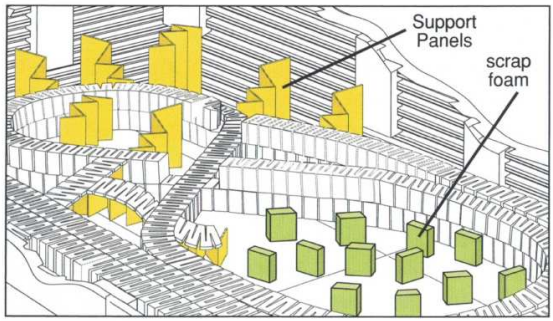
Bridges differ depending on model and manufacturer. Always review the bridge manufacturer's instructions before installation. Paint the bridge before installation. Once your bridge is painted, attach the bridge to Risers. If your bridge includes a track section as part of the bridge, attach it to the layout when you install the track. If your bridge has a flat deck on which track will be laid, it should be installed along with the Track-Bed (page 76).

Some bridges have a thinner or narrower area where the bridge is to be attached to the layout. Examine the underside of your bridge. Use a Foam Pencil to mark your layout where the bridge will rest, then place it on the layout. Double check the bridge's positioning and alignment. Check to be sure it is at the right elevation to meet your track and also is positioned correctly on each side where it connects to the layout. Notch the foam or install shims wherever necessary to make sure the bridge is placed correctly. When you are satisfied with the bridge's position, glue the bridge in place.

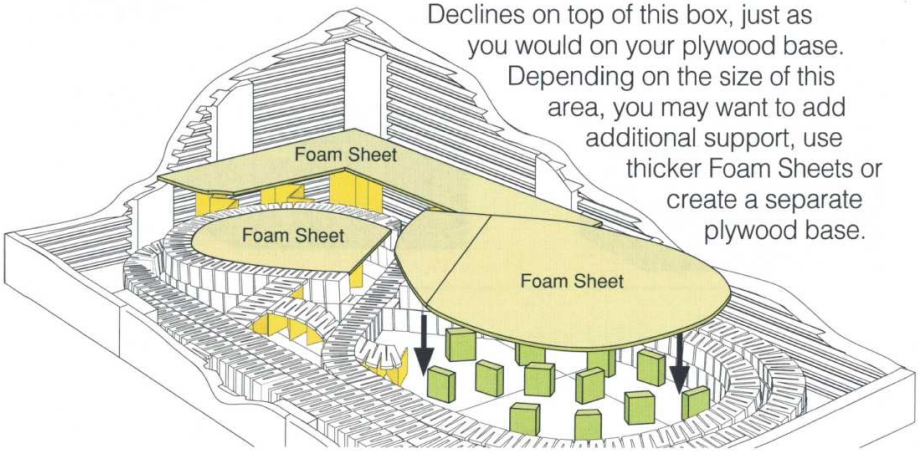
CREATE LEVEL ELEVATED AREAS

When creating towns and parking areas or placing buildings, you might want an elevated flat area. Decide where the area will be located and what shape it should be. If the elevated area must fit the contours of a Riser or other feature, trace the contour on a sheet of paper, then transfer the shape to a Foam Sheet. Cut the contour with a Hot Wire Foam Cutter or Foam Knife.

Support Panels can be cut to size and used under Foam Sheets to create elevated flat areas. You can also cut several small pieces of foam from scraps if you need a different height. Pin the foam in place to test the height of your supports.

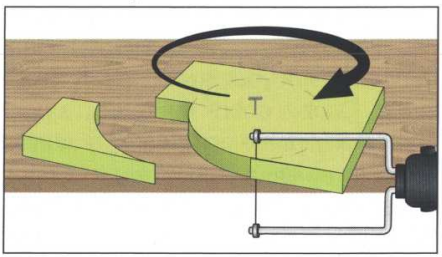


It would also be possible to build a separate elevated area. Construct a "box" out of Foam Sheets to support this area. Place this box on your layout. Use Inclines/Declines to reach this elevated area. Install Risers and Inclines/Declines on top of this box, just as you would on your plywood base. Depending on the size of this area, you may want to add additional support, use thicker Foam Sheets or create a separate plywood base.



CUTTING FOAM CIRCLES

It is easy to cut perfect circles from Foam Sheets with the Hot Wire Foam Cutter. Use a Foam Nail to pin a piece of foam to your work table. The Foam Nail should be the same distance from the edge of the table as the radius of your circle. Hold your Hot Wire Foam Cutter against the edge of the table and rotate the piece of foam around the Foam Nail. As the foam rotates, the Hot Wire Foam Cutter will cut a perfect circle.



TEST YOUR LAYOUT

Once all of the Risers and Inclines/Declines are firmly pinned in place, test your track. Lay the track sections directly on top of the SubTerrain Risers and Inclines/Declines. Pin track in place using Foam Nails. Stick Foam Nails in at an angle or push them all the way in to avoid interfering with your train.

Use rail joiners to mechanically and electrically join the track sections together. Be sure to use insulated rail joiners where appropriate to ensure proper wiring and current flow. Run wiring neatly down the sides of Risers and Inclines/Declines and along the base to the power supply. Connect all necessary wiring to the track, turnouts and power supply. Follow the wiring instructions for your track plan, power supply and turnouts, or review one of the many books on wiring available from your local hobby shop.

Now you can test-run your train. Check for derailing. Since Risers and Incline/Declines are not permanently installed, they can be removed, repositioned and re-pinned as necessary.

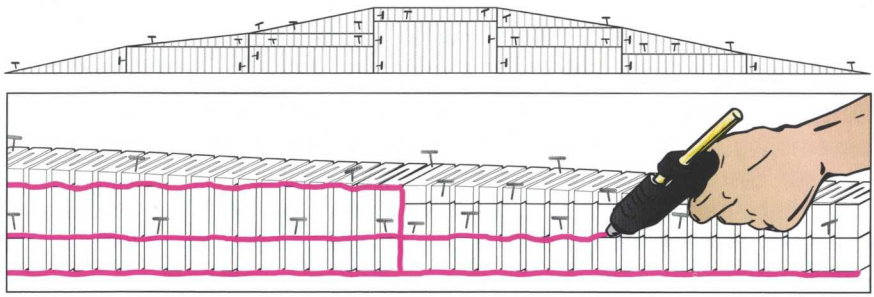
This is also a good time to be sure your engine will pull your train up steep grades. Check Risers and Inclines/Declines to be certain they are centered under the track and the track joints all fit together tightly. Adjust as needed.

ADHERING FOAM COMPONENTS ONLINE VIDEO

Once you are satisfied with how your understructure functions, it is time to permanently install the SubTerrain foam components.

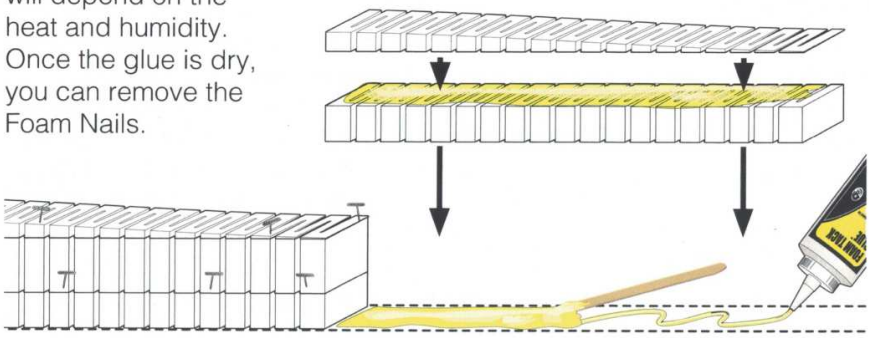
USING LOW TEMP FOAM GLUE

If you use Low Temp Foam Glue, run a bead of glue around where each foam component connects to the next one. This glue will set quickly. It is usually not necessary to move or disassemble your work in order to apply the glue. This technique will allow you to test your work and make changes as necessary before permanently gluing anything in place. You can also use Low Temp Foam Glue between sheets of foam, as well as between foam and other products. Remove Foam Nails once the glue is dry.



USING FOAM TACK GLUE

Foam Tack Glue must be spread on the surface of materials in order to adhere together, so you will have to take your work apart in order to apply the glue. This glue also sets more slowly than Low Temp Foam Glue, so you will want to use Foam Nails until the foam sets. Drying time will depend on the heat and humidity. Once the glue is dry, you can remove the Foam Nails.



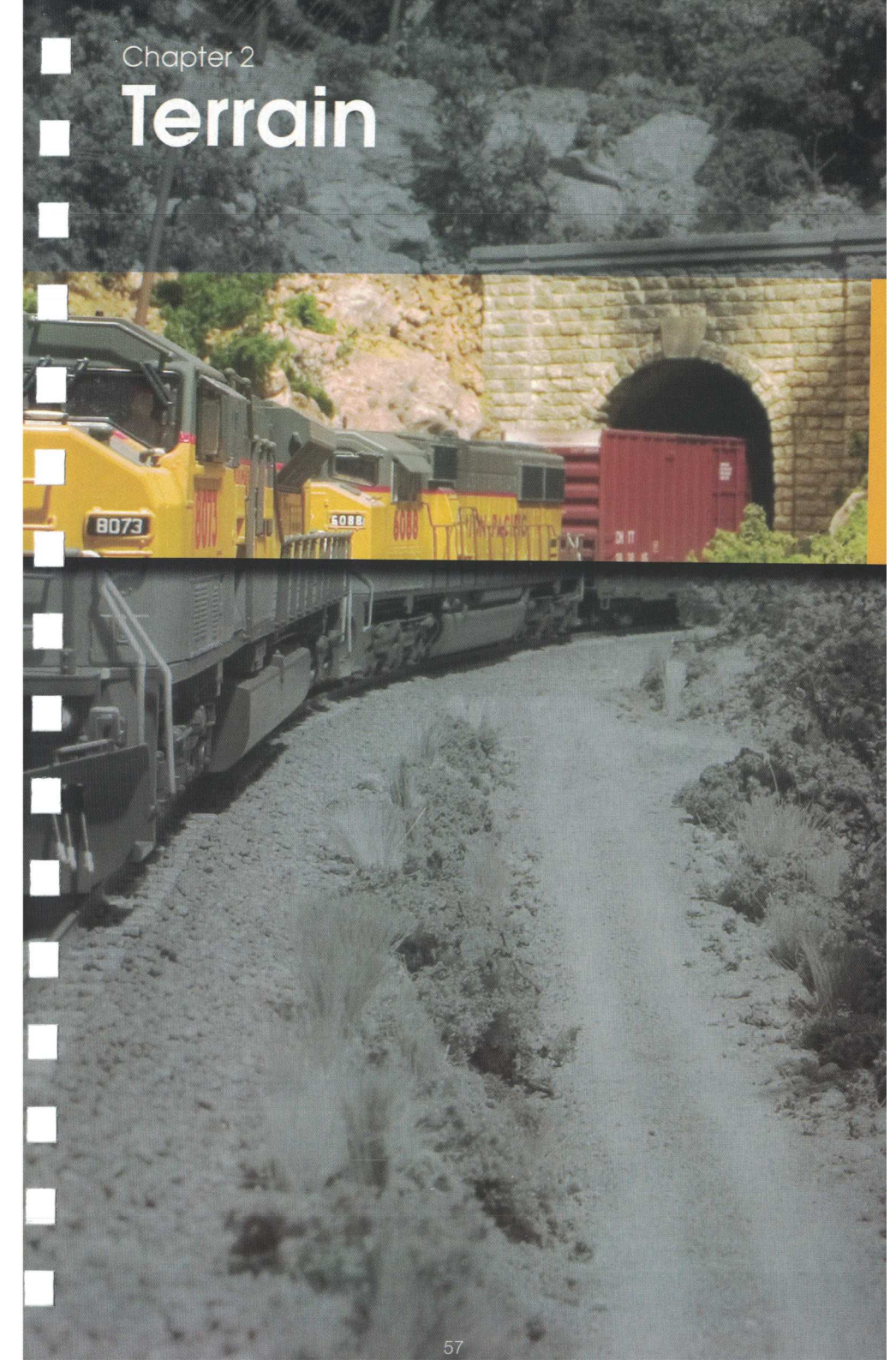
CONTACT CEMENT

Glue requires air to dry. If you spread Foam Tack Glue on a Foam Sheet and attempt to place another Foam Sheet over it, the glue will not dry in the center. When you are using Foam Tack Glue to adhere foam components, consider using it as contact cement. Using Foam Tack Glue as contact cement creates an instant bond between the foam components and allows large surfaces to be adhered to each other.

To use Foam Tack Glue as contact cement, spread an even layer of Foam Tack Glue on the two surfaces that will be glued together. Allow the Foam Tack Glue to dry until it is clear and tacky. The maximum working time is 1 hour. Once it is clear and tacky, align and press the components together. The glue will bond the two surfaces together almost instantly. Work in manageable sections. If the maximum working time is exceeded and the glue dries out, simply spread another layer over the first and start the process over. Always use this method when sandwiching large sections of Foam Sheets together.

PRE-ASSEMBLE RISERS AND INCLINES/DECLINES

Simplify installation of Incline/Decline Starters and Risers by pre-assembling sections. Start with the lowest section and work toward the highest. Stack Risers and Incline/Decline Starters to desired height. Glue these together with the Low Temp Foam Glue Gun, or Foam Tack Glue. Install these pre-assembled sections just as you would Incline/Decline Sets.



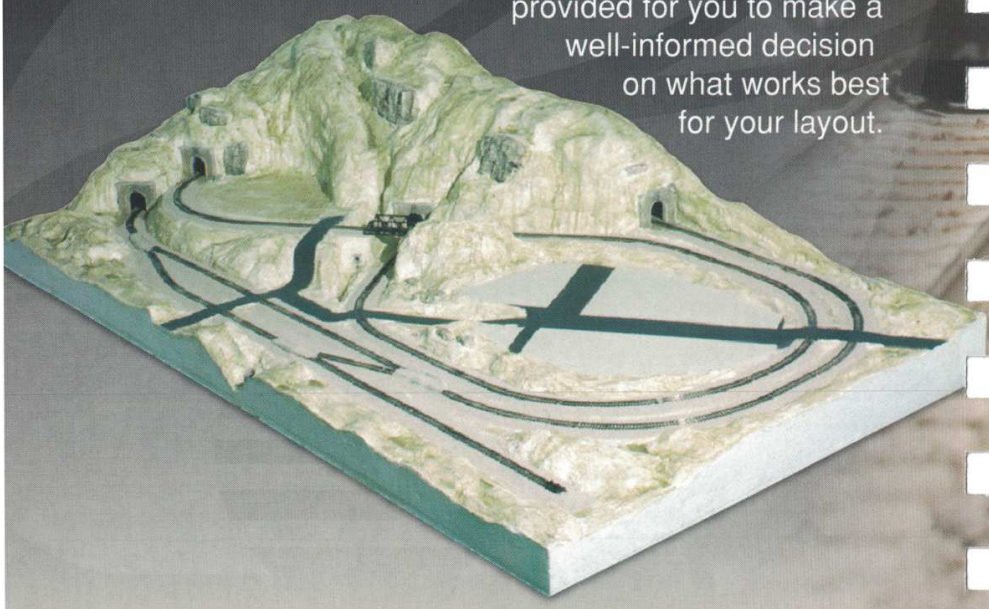
Chapter 2

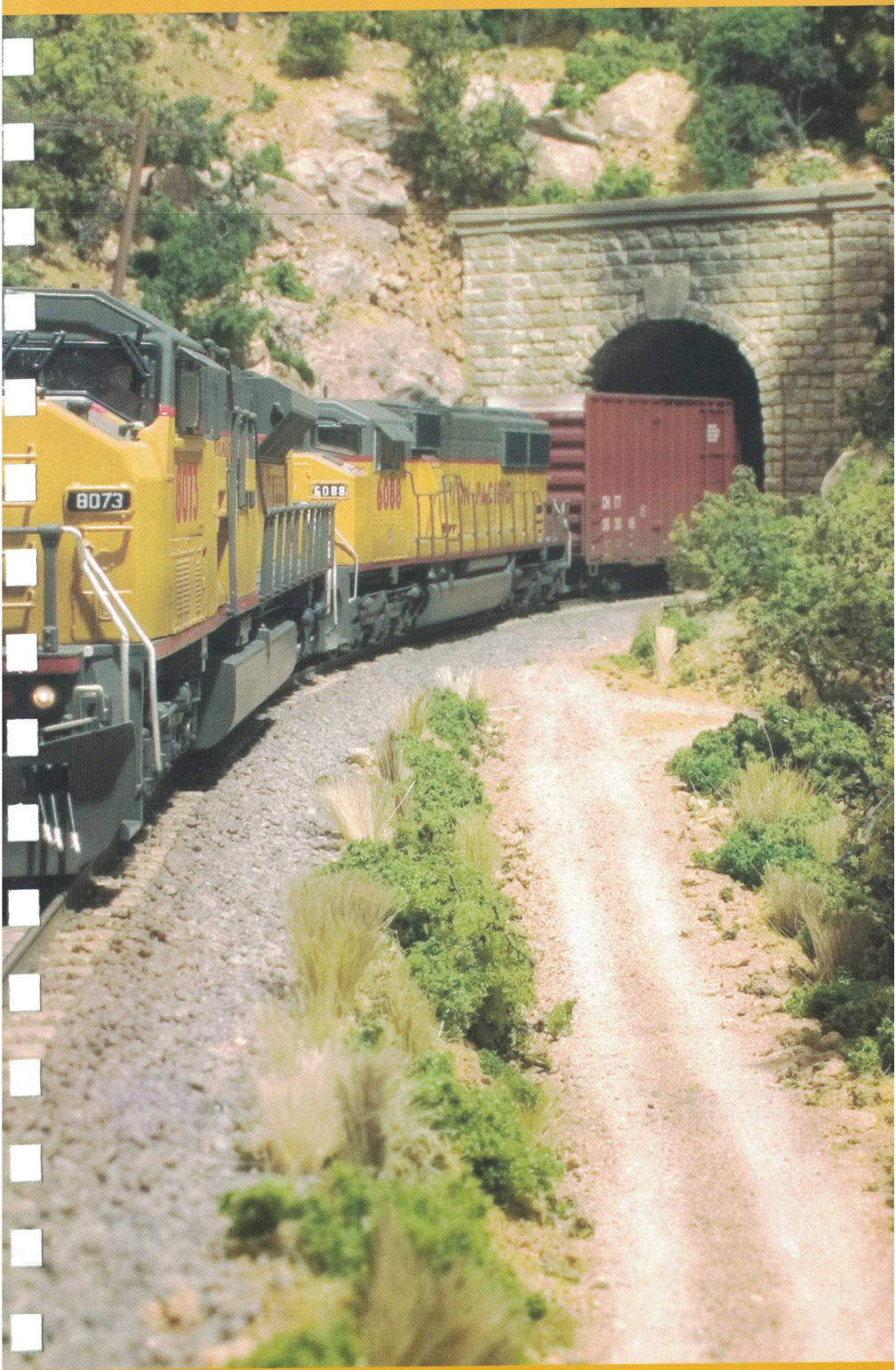
Terrain

Once the SubTerrain understructure of your layout is finished, the next step is to create the terrain shell. The terrain shell is the hard surface you will later paint, landscape and place details like structures or figures. To create the terrain shell, you will cover your SubTerrain with materials that form the physical features like mountains, hills and waterways. These physical features should reflect your original layout plan (pages 38-39).

In order to build your terrain, you must first determine what kind of shell you are going to have and how you want to build it. This will affect the materials you use. For example, if you are in a modular group or plan to present your layout at different shows, you may need a terrain shell that is lightweight for easy transport. On the other hand, if you plan to have a lot of structures and heavy features, you may need a terrain shell that is weight-bearing.

This chapter begins with introducing the different tools and plasters that will be used to build your terrain shell. Additional products that are not used throughout the chapter will be introduced as they are applied. Information about these tools and plasters, such as working time and strength, are provided for you to make a well-informed decision on what works best for your layout.

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TERRAIN SYSTEM TOOLS

Product Overview

Plaster Cloth/Modeling Tray

The Plaster Cloth/Modeling Tray is made of durable non-stick silicone. The tray offers fast, easy cleanup and long-lasting use. It is perfect for dipping Plaster Cloth and pouring molds, plaster slabs and expansive rock walls. The Plaster Cloth/Modeling Tray Includes side grips for easy lifting.

Plaster Mixing Set

Plaster Bowls and Spatula are fast and easy to clean, wet or dry! The Measuring Cup and Mixing Bowl are marked in both ounces and milliliters for easy measuring. The Plaster Mixing Set is made of durable silicone for continual use and easy cleanup, and the bowls are collapsible for easy storage.

Easy Rock Carving Tools

Use the Easy Rock Carving Tools with Carving Plaster to carve custom rock formations.

ONLINE VIDEO

The Strata Tool helps you carve and shape large areas fast to model strata, blasted rock and other weathered and eroded outcrops.

The Carving Tool has two sides - a Chisel and a Pick. Use the Chisel to carve gouges and cavities. Use the Pick to carve grooves, fine-line abrasions and striation markings.

Keep your carving area free from debris with the Duster.

COMPARING PLASTER CLOTH AND SHAPER SHEET®

Plaster Cloth and Shaper Sheet can be used to create many of the same things—just in different ways. Both are great options for not only creating the terrain shell for your layout but also school projects or arts and crafts. They can also be used together for exceptional results.

Product Overview

Plaster Cloth

Plaster Cloth is an easy and convenient method for modeling the terrain base and lightweight land contours. This plaster-coated cloth creates a durable, hard shell without needing additional plaster. It is designed to easily accept Earth Colors Liquid Pigment, paints, plaster castings and landscaping materials with realistic results. Plaster Cloth can also be used for blending and filling in gaps around rocks or terrain.

Plaster Cloth takes on the shape of the objects it covers, so a support structure is required to mold a landscape's contours. Creating understructure using wads of No-News Paper or Support Panels will be discussed later in the chapter (pages 65-66).

ONLINE VIDEO

Shaper Sheet®

Shaper Sheet is a unique material for modeling all types of terrain. It can also be used for backdrops and other dioramas. This strong, pliable sheet can be shaped and reshaped to create any level of detail and can hold its form without any understructure. Shaper Sheet is formulated to mechanically bond with plaster to create a thin, durable and hard shell that easily accepts Earth Colors Liquid Pigment (page 113) and landscaping material.

If you model with Shaper Sheet you may or may not need an understructure. The need for understructure will depend upon the size and form of the model you are making.

ONLINE VIDEO

CHOOSING YOUR PLASTER

Once you have decided between Plaster Cloth and Shaper Sheet for your terrain shell, the next step is to determine which plasters will be needed. These plasters will be used to create rocks, add texture to the terrain shell, smooth rough areas, fill gaps, carve rock faces, seal water areas and strengthen the terrain shell. The plaster you use for your layout is very important because not all plasters are the same. Some plasters are easy to carve, while others offer more strength or a longer working time. The plaster you choose will depend on your layout plans, and you may need to use more than one to create your model. The Plaster Comparison Chart can help you decide which plaster will fit your needs.

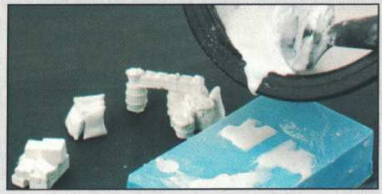
PLASTER COMPARISON CHART

PLASTER SPECS	SUPER STRENGTH PLASTER	SHAPER SHEET PLASTER	LIGHTWEIGHT HYDROCAL PLASTER	CARVING PLASTER	MOLD-A-SCENE PLASTER
STRENGTH (1 = WEAK / 10 = STRONG)	10	8	5	4	2
WORKING TIME (1 = SHORT / 10 = LONG)	6	10	2	8	2
CURE TIME (1 = SLOW / 10 = FAST)	3	5	9	7	8
CURED WEIGHT (1 = HEAVY / 10 = LIGHT)	2	4	10	6	9
CARVABILITY (1 = HARD / 10 = SOFT)	1	3	6	10	8
CASTING DETAIL (1 = LOW / 10 = HIGH)	10	9	7	5	1

Product Overview

Super Strength Plaster™

Super Strength Plaster is a very heavy and very strong plaster that gives a lot of casting detail. If you have areas on your layout that need to bear weight, this would be the best plaster to use. This plaster also works well for outdoor plaster projects and statuary castings.



Shaper Sheet® Plaster

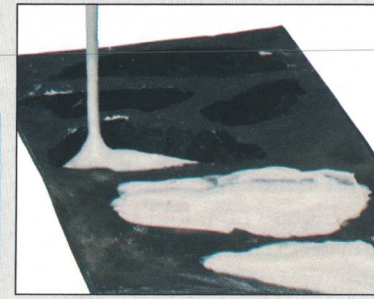
Shaper Sheet Plaster is designed to bond with Shaper Sheet. To create a permanent, hard surface with Shaper Sheet, just coat it with Shaper Sheet Plaster. This plaster is strong and has a long working time, which makes it great for large projects.

Lightweight Hydrocal®*

Lightweight Hydrocal is specially formulated for terrain modeling and castings. If you are concerned about adding weight to your layout, this plaster has a very light cure weight.

Lightweight Hydrocal makes it easy to cast rocks and works well with our rock molds. After you make the castings, you can use Lightweight Hydrocal to attach castings to your layout and fill in any gaps. Once it's dry, you can still carve it to add details or allow rock castings to fit together.

**Hydrocal is a U.S. Gypsum registered trademark.*



Carving Plaster™

Carving Plaster has an extended application time and is easy to carve once it's dry. Use this plaster to carve rock faces, bridge abutments, piers, and other terrain and structure formations. You can even use this plaster to create cobblestone or brick effects on your layout.

Try using our Easy Rock Carving Tools to carve custom rock formations quickly and easily. These tools will help you carve strata lines and blasted rock, as well as erosion or other rock formations.

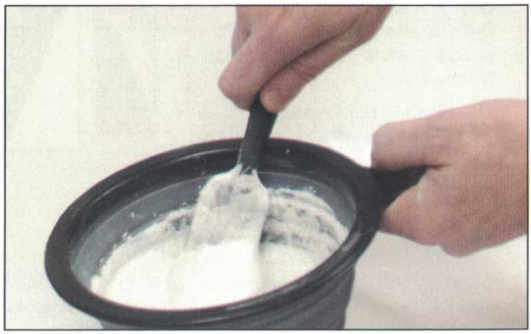
Mold-A-Scene™ Plaster

Mold-A-Scene Plaster is a sculptable plaster that can be shaped like modeling clay using your hands or a trowel-like tool. This plaster is great for modeling barren and rocky terrain, especially desert and beach areas. It can also be used to repair holes and add detail. Use this plaster to build up the banks of a river, enhance a mountain or blend a raised railroad track into the terrain.

Mold-A-Scene does not need much coloration or landscaping to model a realistic desert, beach or other dry terrain. Simply mix it and spread it across your terrain contours for an instant dusty, sandy texture. Mold-A-Scene can also create smoother terrain. The more you knead it, the smoother it becomes.

MIXING PLASTERS

Each plaster is different, so be sure to follow package instructions. You can adjust the ratio of plaster and water to fit your needs. A general rule is that mixing plaster with less water (or more plaster) will result in a thicker plaster. Adding more water (or less plaster) will result in thinner plaster. Use thicker plaster when using it anywhere the plaster may run or drip, like when attaching plaster castings to your layout or joining sheets of Shaper Sheet. You can mix plaster to a paste-like consistency, which is useful when working in vertical areas. Please note that when you do mix thicker plaster, you will have less working time before it begins to set. Thinner plaster is best used in molds to cast objects, to fill in cracks or crevices and to seal water areas.



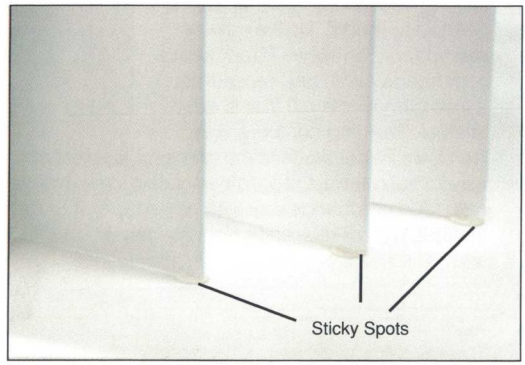
Make sure to clean your mixing bowl before and after each use. Any residual plaster flakes from a previous plaster batch can contaminate a freshly mixed batch and cause new castings to crumble. We recommend using the Plaster Mixing Set because each item has been designed to be easy to clean. To remove excess dried plaster, collapse the Mixing Bowl over a trash can. The dried plaster will pop out of the bowl easily. To finish cleaning the Mixing Bowl, wipe it with a damp towel. Wipe all tools with a damp paper towel until the plaster residue is gone. Remember to never rinse plaster down the drain (it will clog).

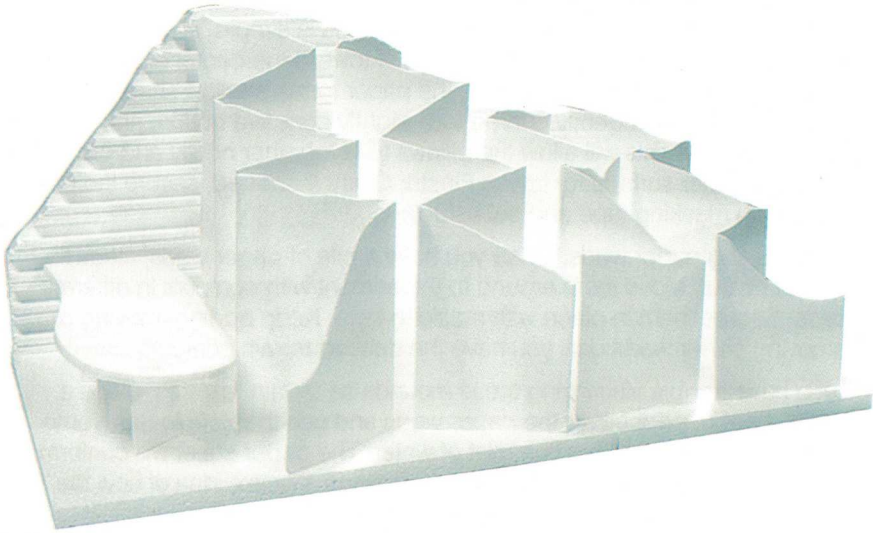
SUPPORT STRUCTURE AND BUILDING YOUR TERRAIN CONTOURS

A landscape's hard terrain shell typically needs a support structure, or understructure, to keep the shell elevated and intact. The products you choose for your support structure may vary from project to project depending on the size of your model, terrain shell product you are using (Plaster Cloth or Shaper Sheet), materials you already have on hand, cost and personal preference. Support Panels and paper wads are both excellent options for creating a support structure. When planning your support structure, remember to reference the layout plan to ensure you do not create contours in areas that you plan to put buildings, roads, railroad track, rivers or other features.

SUPPORT PANELS

The 4" Support Panels are great for building mountains quickly. Arrange Support Panels side-by-side in a diamond-shaped grid over the entire terrain area, leaving 1" space between the Panels. Tack each panel in place with Sticky Spots. Sticky Spots will hold the panels firmly in place while also allowing repositioning. To reposition a panel placed with Sticky Spots, lift the edge of the Sticky Spot and pull up slowly to release. Re-stick the panel wherever you like. To permanently secure Support Panels, leave Sticky Spots in place and run a bead of Low Temp Foam Glue or Foam Tack Glue around the bottom of the Support Panel.





We strongly recommend using the Hot Wire Foam Cutter to create height variation and contours. This will allow you to cut the panels freehand while they are positioned on your layout base—no removal or measuring required. However, you may want to cut the Support Panels to a specific height or create precise contours. To do so, collapse the Support Panel then mark the length of your highest desired terrain point on the Support Panel. Cut the Support Panel at the mark with the Hot Wire Foam Cutter, Foam Knife, scissors or a hobby knife. Reposition the panel on your layout and keep scrap pieces for later use. Use the scrap foam to build height back up if you cut a contour too low.

Product Overview

No-News Paper™

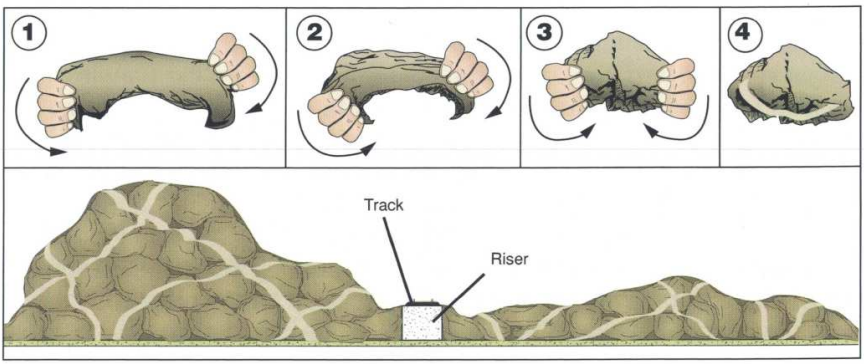
No-News Paper is a terrain-building material that is thicker than newspaper. No-News Paper's extra thickness offers more support and reduces the amount of paper needed to model. Unlike regular newspaper, No-News Paper keeps your hands clean and mess-free. It also comes in a roll that is easy to store. Building contours with No-News Paper wads is the quickest, easiest and least expensive way to build terrain regardless of skill level. No-News Paper can be used interchangeably with newspaper. For the purpose of this manual, we will reference both as "paper" and "paper wads."

FORMING PAPER WADS

Forming mountainous contours with paper wads is simple. First, curl the edges of a sheet of paper underneath itself toward the center of the sheet. Keep curling toward the center until the paper forms a pillow shape. The pillow should have a gently curved top, slightly concave bottom and rounded edges. This will allow the pillows to fit together neatly and provide a smooth upper surface for laying Plaster Cloth. If needed, secure the pillow shape with masking tape and set aside.

Keep making paper wads. Once you have a pile of paper wads, stack them on your layout. Move them around to experiment with contours in different areas. Secure them in place with masking tape. Keep adding, moving or removing paper wads until you have the desired terrain contours.

If you have trouble visualizing these mounds as terrain features, place a single sheet of paper over the paper wads and use the Scenic Sprayer to wet the sheet down with a fine mist of water. The paper sheet will conform to the shape that has been created and provide a better idea of how the contours will look once they are covered with Plaster Cloth.



PLASTER CLOTH TECHNIQUES

Plaster Cloth is unique because when it is wet, it will mold itself and adhere to the shape it is applied to. For this reason, it will always need an understructure like paper wads or Support Panels. After Plaster Cloth dries, it becomes a self-supporting hard shell that can be cut into or have its understructure removed without losing its form. This quality is ideal for beginning modelers who may need to re-shape terrain features. It is also perfect for crafters. Some projects, like masks, need to be formed over an object that can be removed after the Plaster Cloth has dried.

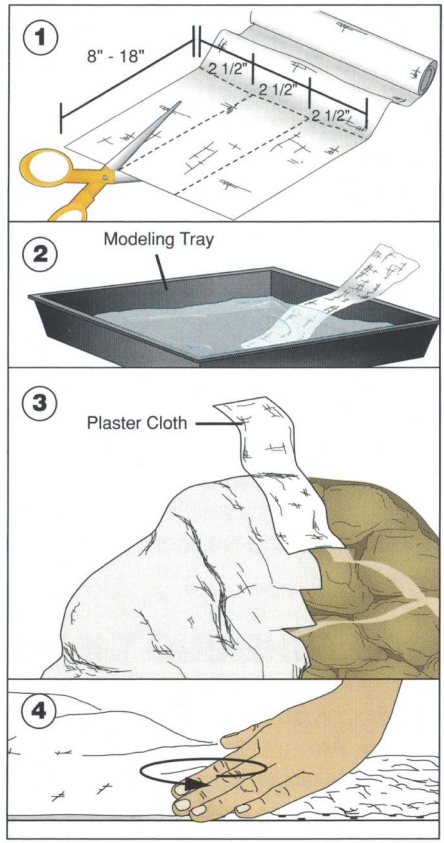
There are two ways to wet Plaster Cloth for application—the Dip Method or the Spray Method. Choose the method that suits your project.

PLASTER CLOTH WITH SUPPORT PANELS

When using Plaster Cloth with Support Panels, place a layer of thick paper across the terrain contours before applying the Plaster Cloth. The paper will prevent the Plaster Cloth from drooping between Support Panels.

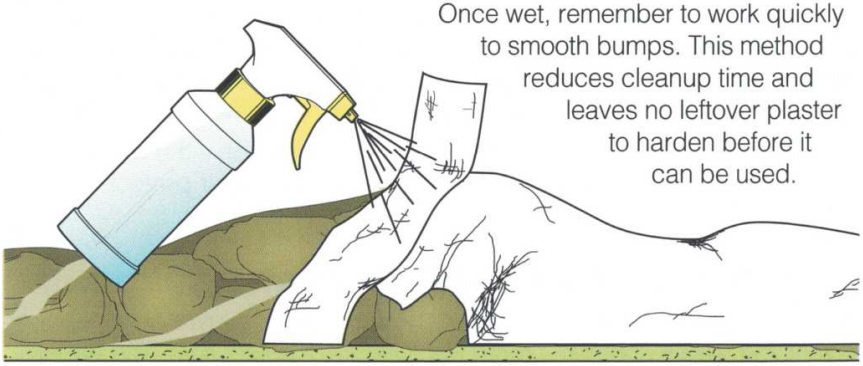
DIP METHOD

Start by cutting Plaster Cloth into approximately 2 1/2" wide strips approximately 8-18" long. Smaller strips are more manageable for beginners. Larger strips are more expedient. To apply strips to the layout, dip a strip into a pan of water (about 1" deep), then quickly place the wet strip on your layout, bumpy side up. Do not allow Plaster Cloth to sit in the water. With wet fingertips, smooth the bumps so that the holes in the Plaster Cloth fill in completely. Smooth the bumps on each strip before adding the next. Plaster Cloth will begin to harden within minutes of coming in contact with water, so work quickly. Overlap each strip with the next by 50%. When applied in this manner, you will have two layers of Plaster Cloth over the entire layout with no overlapping seams. This method will produce a very strong covering for your layout without requiring additional plaster or other bonding materials.



SPRAY METHOD

To apply Plaster Cloth with the spray method, lay dry pieces of Plaster Cloth on paper wads, Profile Boards, Risers, or Support Panels. Then use the Scenic Sprayer (page 104) to mist the Plaster Cloth with water. Lay one strip, spray it with water, smooth the bumps and then lay another. Overlap strips. Once wet, remember to work quickly to smooth bumps. This method reduces cleanup time and leaves no leftover plaster to harden before it can be used.



FLAT AREAS

Wrinkles will occur due to the nature of Plaster Cloth. This adds character to terrain. However, wrinkles can cause problems if they occur in areas that should be flat, like parking lots or underneath track. To prevent wrinkles, butt ends of Plaster Cloth sections without overlapping the edges. Smooth bumps, wrinkles or folds immediately when the Plaster Cloth is still wet. After it is dry, sand to remove any rough spots.

DRY TIME

Dry time depends upon the thickness of application, heat and humidity. Plaster Cloth typically hardens into a firm shell in 30 minutes or less, but it is not necessarily dry. Let Plaster Cloth dry four to six hours before coloring or applying landscaping materials. For tough durable terrain, let it harden overnight. To expedite the drying process, you can aim a fan and/or heat lamp at the layout. Wet Plaster Cloth will feel cool to the touch and look a little off-white. Dry Plaster Cloth will appear bright white and be room temperature.

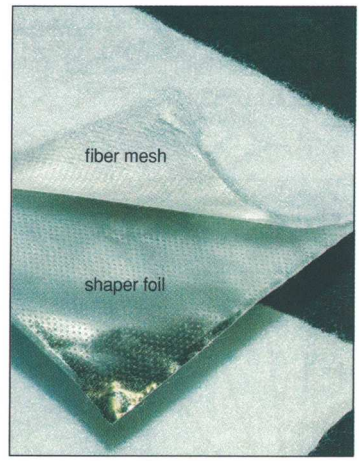
STRENGTHENING THE TERRAIN SHELL

To strengthen the Plaster Cloth shell, apply an additional layer of Plaster Cloth or brush on a coat of Shaper Sheet Plaster or Super Strength Plaster. Add a layer of plaster in areas where the holes weren't filled to prevent leakage when pouring the water base (page 174) for your water feature. Be sure to mist the dry shell with water before applying more Plaster Cloth or plaster. This will ensure the plaster bonds to the dry shell.

SHAPER SHEET TECHNIQUES

Modeling with Shaper Sheet is very different than Plaster Cloth because, in most applications, Shaper Sheet is self-supporting. Some applications need Shaper Sheet to remain flexible and do not require plaster, while others must be completed with plaster to ensure the Shaper Sheet holds its shape permanently. These easy techniques will describe how to use Shaper Sheet with and without plaster.

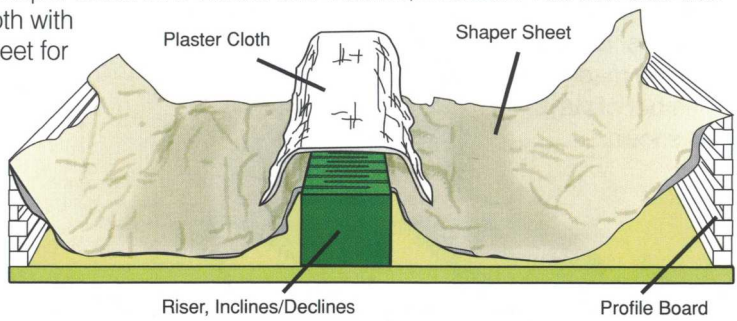
The white felt-like side, fiber mesh, of the Shaper Sheet is the side you want facing up on your layout. You can apply plaster and landscaping items to the fiber mesh. The shaper foil side is the underside of the Shaper Sheet and is typically not exposed in finished projects. However, some modelers do choose to flip Shaper Sheet and use the shaper foil as a smooth surface to paint (use enamel paint and/or lightly sand the foil before applying paint). There is also a layer of adhesive on the shaper foil beneath the fiber mesh. For our purposes, we will be discussing modeling on the fiber mesh, not the shaper foil.



FORMING TERRAIN CONTOURS

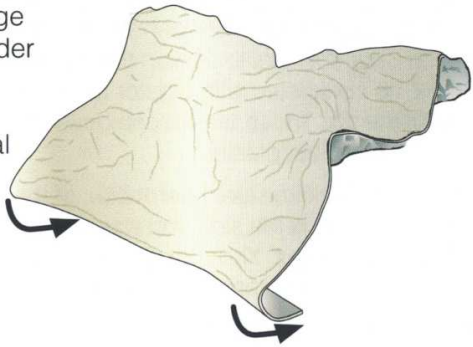
Shaper Sheet is incredibly versatile. The pliable material can be folded, scrunched, twisted, etc. When it moves, Shaper Sheet begins to form wrinkles both on the shaper foil side and the fiber mesh side. The wrinkles in the fiber mesh will create texture and contours for your project, as well as strengthen it. When modeling terrain, the wrinkles create appealing and realistic terrain variations. Manipulate the Shaper Sheet until your free-form object or terrain contours are how you like them. Use Foam Nails or Sticky Spots to tack down one side of large sections of Shaper Sheet while you shape it. This will make it easier to handle.

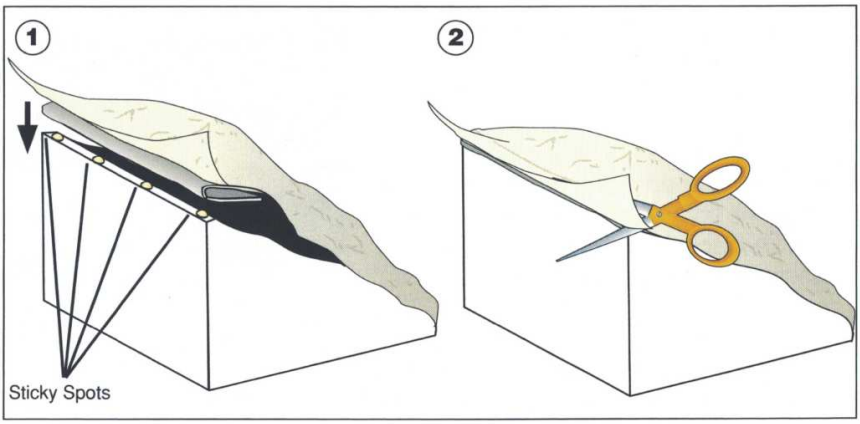
It is easier to add wrinkles than remove them, so if you want to make a flat surface, don't bend, fold or scrunch the Shaper Sheet. For example, when installing Shaper Sheet over Risers and Inclines/Declines. You can also use Plaster Cloth with Shaper Sheet for flat areas.



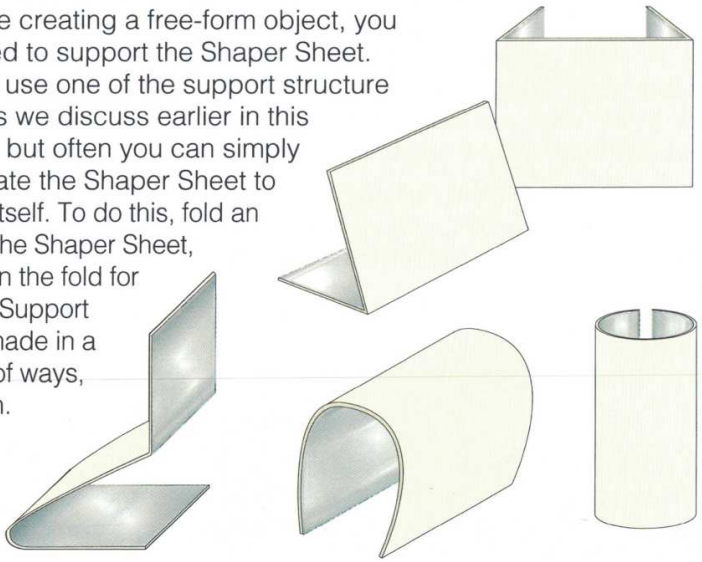
A STRONG CLEAN EDGE

Free-standing terrain features are strengthened when the outer edge of the Shaper Sheet is folded under itself, shaper foil to shaper foil. Make the fold at least one to two inches wide, or wider if additional strength is needed. Fold all edges under. Once folded, no shaper foil will be visible, only the fiber mesh.





If you are creating a free-form object, you may need to support the Shaper Sheet. You can use one of the support structure materials we discuss earlier in this chapter, but often you can simply manipulate the Shaper Sheet to support itself. To do this, fold an edge of the Shaper Sheet, then open the fold for support. Support can be made in a number of ways, as shown.

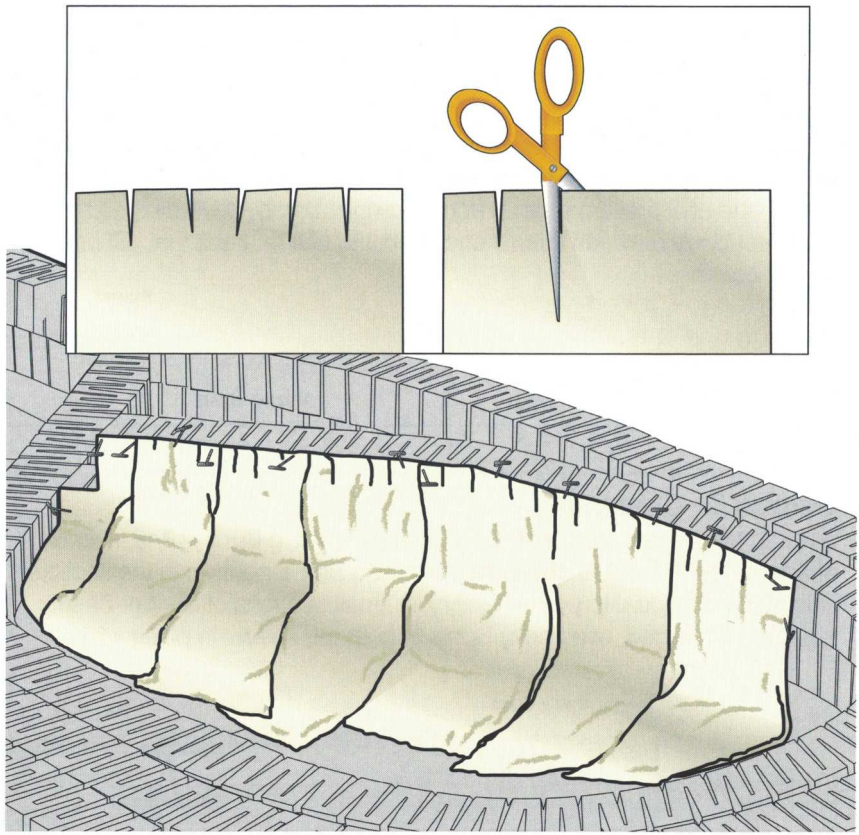


THE RIGHT SIZE

Shaper Sheet is very different than Plaster Cloth because Shaper Sheet does not conform to shapes you create with paper wads or Support Panels. Rather, it becomes the shape you create with it. This is very important to understand when considering what size of sheet you need to create the project you want.

Consider the rough shape of your project before you begin to cut into the Shaper Sheet. Measure the area it will cover, then roughly shape your terrain features. Always cut the Shaper Sheet slightly larger than the project area to compensate for the contours that are formed while shaping. Cut Shaper Sheet to size with scissors.

You do not have to use a whole sheet of Shaper Sheet as is. Create contours around tight curves by cutting a sheet into small sections. Pin the sections in place temporarily with Foam Nails. You can even cut relief notches in edges of sheets to allow the sheet to flex when wrapped around tight curves. Then, permanently join the sections using Option 3 as noted in the Connecting Sheets section (see page 72). Remove the Foam Nails as you apply plaster.



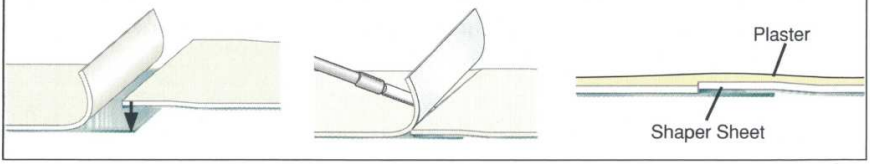
CONNECTING SHEETS

Connecting flat sections of Shaper Sheet together allows modelers to create long spans and large projects. Join pieces together until you have the size you need. Large expanses will likely need an understructure. Support Panels are recommended for the support structure because they are tidy and can be temporarily placed. If the expanse will bear any significant weight, plaster is recommended to lock the contours in place (page 73).

You have three options when joining sheets or sections together:

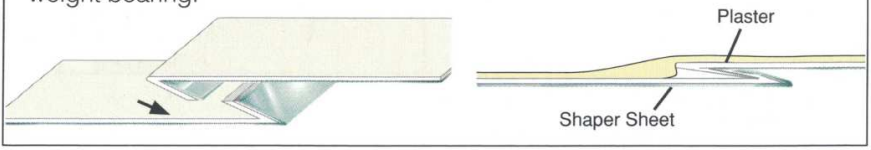
Option 1 - Peel

Take one sheet and peel the fiber mesh away from the shaper foil about 1" to expose the tacky surface. Be sure to pull the gauze backing, as well. Press the joining Shaper Sheet on the tacky surface. Then, cut away excess fiber or fold it over the seam. This method works if you are joining sheets that won't be plastered or when you need a seamless transition.



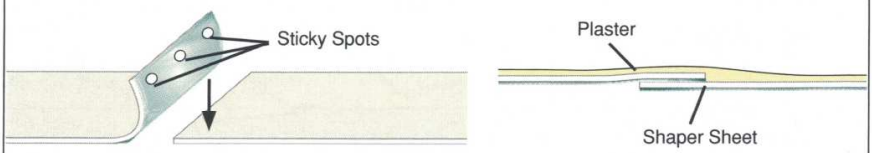
Option 2 - Fold

Fold the edges of the two sheets as shown below. Flatten the two sheets together at the fold and apply a layer of Shaper Sheet Plaster to ensure a good bond and prevent a seam from showing. This method creates the strongest bond between sheets and is best to use in areas that will be weight bearing.



Option 3 - Overlap

Overlap two sheets, both with the fiber mesh facing up. Apply a layer of Shaper Sheet Plaster to cover the seam and permanently join the sections. This method is ideal to permanently join small sections of Shaper Sheet together. If needed, use Sticky Spots to hold the sheets in place while



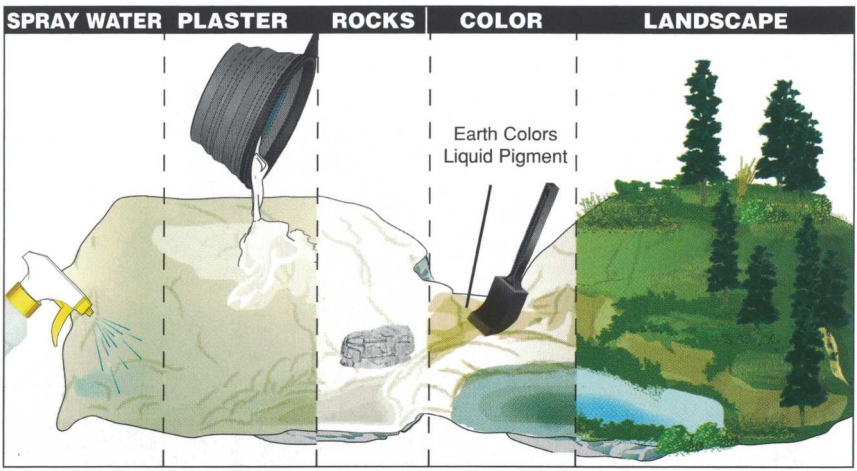
applying plaster. Apply Sticky Spots to the shaper foil before pressing it to the bottom sheet's fiber mesh. Sticky Spots will grab the fiber mesh for a temporary hold. Sticky Spots do not need to be removed before plaster application. You can also use Sticky Spots to adhere the Foam Sheets to Profile Boards or other SubTerrain foam components.

USING SHAPER SHEET WITH PLASTER

For projects that are permanent, very large, uniquely shaped or support objects of significant weight, we recommend using Shaper Sheet Plaster to coat the Shaper Sheet. Any Woodland plaster, or Plaster Cloth, can be used on Shaper Sheet for different results. However, Shaper Sheet Plaster is specifically designed to be super strong, have a long working time and mechanically bond with Shaper Sheet's fiber mesh to create a hard and permanent shell. This bond allows many Shaper Sheet models to stand freely without an understructure or with very minimal support.

Form the terrain contours with Shaper Sheet. Then prepare your Shaper Sheet Plaster with the Plaster Mixing Set. Spray the Shaper Sheet's white fiber mesh with water. Use the Plaster Brush Set to brush plaster on the Shaper Sheet. In flat areas, simply pour the plaster onto the Shaper Sheet and spread as needed. Use a thicker plaster when joining Shaper Sheet sections or in areas where the plaster may run. Let it dry before applying paint or landscape items directly to the Shaper Sheet Plaster surface (see Chapter 3).

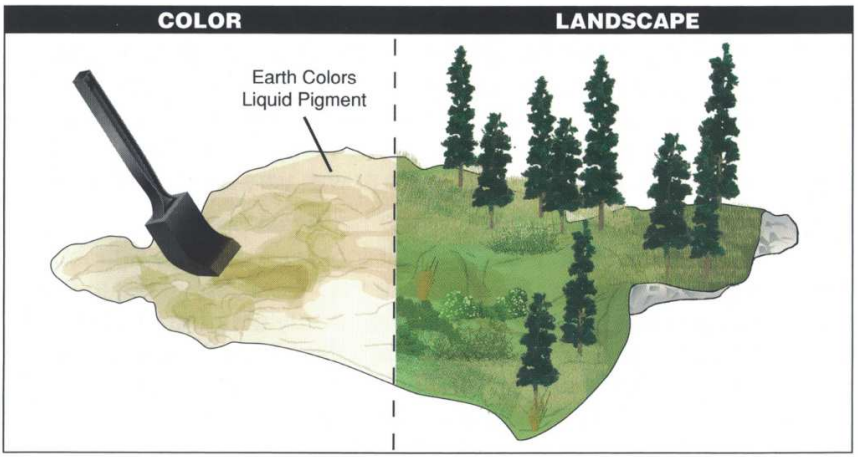
Once coated with plaster, Shaper Sheet is not easy to cut into with a regular hobby knife. Plan large features or rock faces in advance so you don't have to cut into to the terrain contours to make adjustments for fit. If you must cut into Shaper Sheet after plaster is applied, use a serrated blade.



USING SHAPER SHEET WITHOUT PLASTER

Using Shaper Sheet without plaster is ideal for modelers who want a lightweight building material that is mobile, adjustable, quick to form and does not require plaster.

Create the form you want with Shaper Sheet as described previously. Once all the contours are shaped, you are ready to landscape or decorate the Shaper Sheet. The fiber mesh is compatible with Earth Colors Liquid Pigment and Woodland landscape materials (see Chapter 3). When pigments are applied directly to the fiber mesh, it creates realistically textured terrain. Attach trees, turf and bushes directly to the Shaper Sheet fiber mesh with Scenic Glue or Foam Tack Glue.



INSTALL TERRAIN

Now that you understand the tools you need to create terrain shell, it is time for installation. Following your layout plan, install the understructure for Plaster Cloth (page 67) or begin shaping the Shaper Sheet (page 69). Once you have the desired contours, apply your plaster materials (pages 61-64). Once your terrain shell has dried, cover the perimeter of your layout to create a strong, clean edge (page 75).

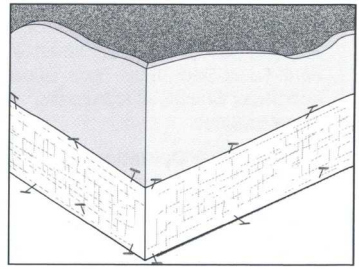
COVER PERIMETER

Give your layout a finished look by covering the exterior surface of the Profile Boards with Plaster Cloth or Flex Paste. This layer will strengthen your layout and provide a clean surface for painting. Once your perimeter is covered, allow your layout to dry before moving ahead with construction. Take this time to plan ahead for the next construction steps, such as installing rocks, roadbed, Tunnel Portals, Culverts and pavement for roads.

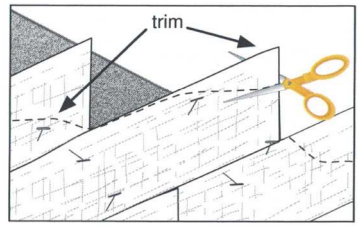
After the Plaster Cloth or Flex Paste has dried and all landscaping and scenery are in place, paint the perimeter with a flat, dark-colored paint for a clean finish.

PLASTER CLOTH PERIMETER

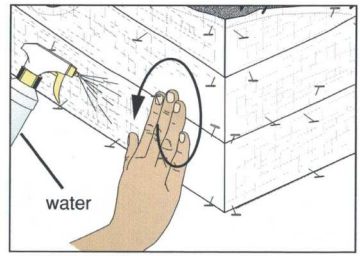
Use Foam Nails to pin dry Plaster Cloth to the outside perimeter of your layout. Pin the Plaster Cloth from the bottom up and do not overlap the sheets to prevent bumps and ridges from forming. Trim the Plaster Cloth so about one inch can be folded over the top edge of your layout. This will provide a smooth, strong upper edge.



Fold the extra over the top of the layout. Then, use the Scenic Sprayer to spray water on the Plaster Cloth in sections. Fill the holes in the Plaster Cloth and work quickly. Smooth the folded edge on top of the layout so that it blends with the terrain shell.



Once dry, fill any visible gaps between Plaster Cloth sheets with a light coat of your choice of Woodland Scenics plaster or Smooth-It (page 93). Use a fine-grade sandpaper to smooth any visible joints where Plaster Cloth is overlapped. Wipe with a clean, damp cloth to remove dust during and after sanding.



FLEX PASTE PERIMETER

Covering the perimeter with Flex Paste is as easy as dipping a brush into the Flex Paste bottle and brushing it on the Profile Boards. Once dry, Flex Paste will remain slightly flexible but will also create a firm shell that helps support your layout. Brush strokes may remain after the Flex Paste has dried. To remove the appearance of brush strokes, sand the Flex Paste surface with fine-grade sandpaper before painting.

You can also use Flex Paste to create a textured exterior. Use a roller brush and roll the Flex Paste over the Profile Boards for an instant, textured look.

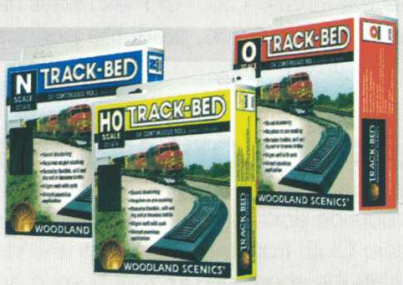
TRACK-BED (ROADBED) ONLINE VIDEO

The material that is put directly under the track is called roadbed. Track must be securely fastened down to this material so that it does not move when trains run. Keep in mind that train motors and wheels are noisy and that a proper roadbed material can help deaden their sound.

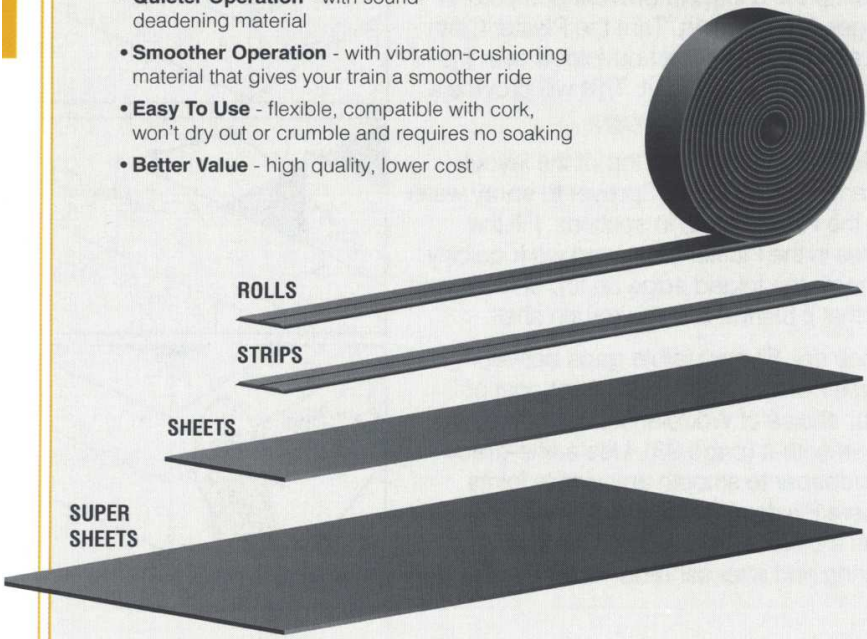
Product Overview

Track-Bed

We recommend our revolutionary Woodland Scenics Track-Bed, available in N, HO and O scales. It was awarded the National Model Railroad Association Conformance Seal. Track-Bed Strips, Rolls, Sheets and Super Sheets all feature the same qualities:



- **Quieter Operation** - with sound-deadening material
- **Smoother Operation** - with vibration-cushioning material that gives your train a smoother ride
- **Easy To Use** - flexible, compatible with cork, won't dry out or crumble and requires no soaking
- **Better Value** - high quality, lower cost



TRACK-BED	N SCALE	HO SCALE	O SCALE
ROLLS	1/8" x 1 1/4" x 24' (3mm x 3.17cm x 7.31m)	3/16" x 1 3/4" x 24' (5mm x 4.44cm x 7.31m)	3/16" x 2 3/4" x 24' (5mm x 6.98cm x 7.31m)
STRIPS	1/8" x 1 1/4" x 24" (3mm x 3.17cm x 60.9cm)	3/16" x 1 3/4" x 24" (5mm x 4.44cm x 60.9cm)	3/16" x 2 3/4" x 24" (5mm x 6.98cm x 60.9cm)
SHEETS	1/8" x 3 1/4" x 24" (3mm x 8.25cm x 60.9cm)	3/16" x 5" x 24" (5mm x 12.7cm x 60.9cm)	3/16" x 5" x 24" (5mm x 12.7cm x 60.9cm)
SUPER SHEETS	1/8" x 12" x 24" (3mm x 30.4cm x 60.9cm)	3/16" x 12" x 24" (5mm x 30.4cm x 60.9cm)	3/16" x 12" x 24" (5mm x 30.4cm x 60.9cm)

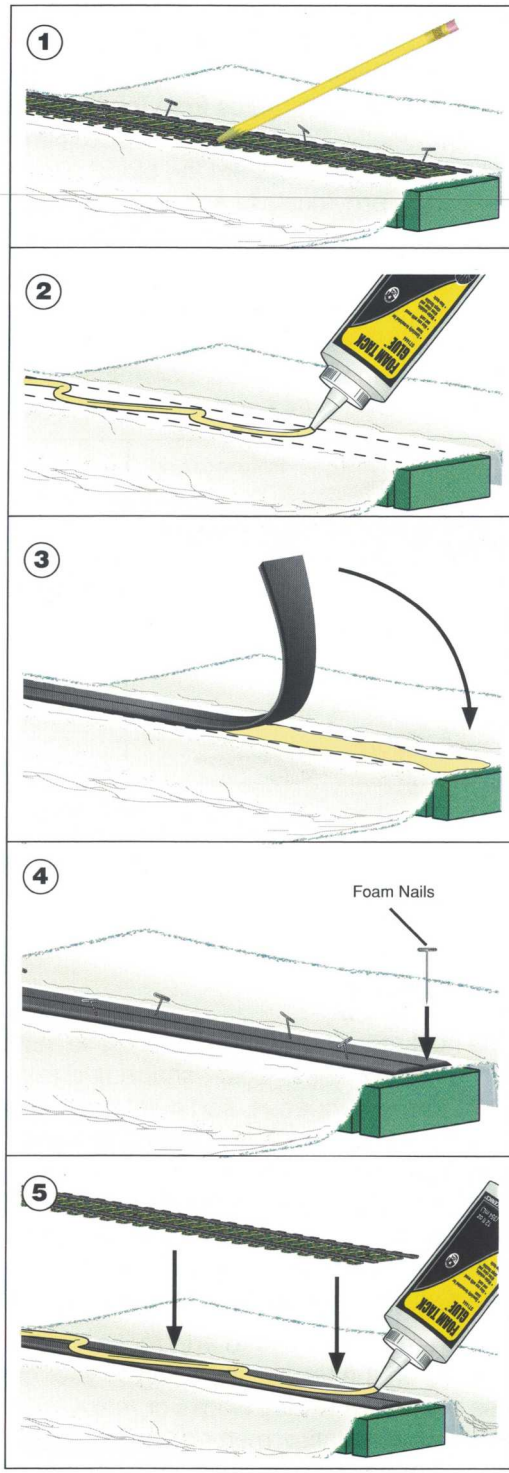
INSTALLING TRACK-BED

Once the plaster shell is dry, lay the track and pin it in place with Foam Nails. This is a good time to test the track for any clearance or derailing problems. You can sand rough patches if they are causing train malfunctions, but installing Track-Bed will correct most of these problems. Other roadbed products are not as resilient and may make these rough areas worse. To sand the rough areas smooth, start with 120-grit sandpaper. Then follow with 220-grit. Wipe the area with a damp cloth after each sanding to remove dust.

(1) Once you are satisfied with the track placement, trace the outline onto the plaster shell and remove the track.

(2) Track-Bed can be glued to most bases using Foam Tack Glue. **(3)** Spread a thin layer of Foam Tack Glue on the plaster shell, then **(4)** pin the Track-Bed in place while the glue dries. **(5)** When dry, remove Foam Nails and install track on Track-Bed.

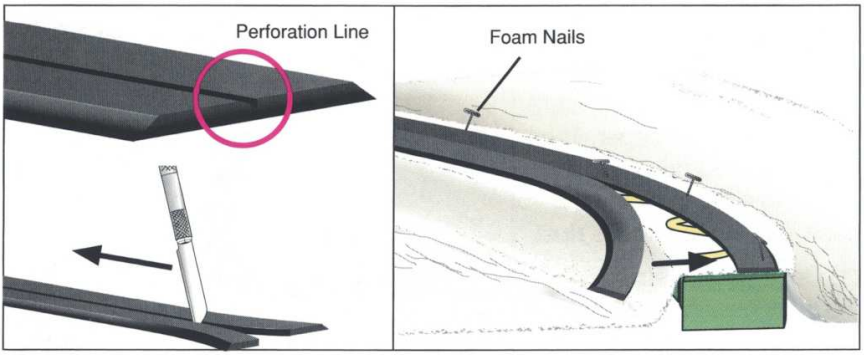
You can also use Foam Tack Glue as contact cement. Spread a thin layer of Foam Tack Glue on both surfaces and let it dry approximately one hour until it is clear and tacky. Press the Track-Bed in place; the glue will bond instantly.



Creating Curves with Track-Bed

Laying Track-Bed around curves is simple. There is a perforation in Track-Bed Strips and Rolls. The perforation allows you to easily separate the outer radius from the inner radius and adjust each independently. Score the Track-Bed along the perforation line with a hobby knife and separate the strips. Then, use the contact method described previously to adhere the strips to your layout.

Remember with the contact method, you need to be precise as the glue bonds instantly. Do not install a whole piece at once. Instead, tack one end of a strip down then, in increments, roll the Track-Bed into place on the curve. Press the Track-Bed to the layout every couple inches. Laying Track-Bed incrementally will allow you to control how the Track-Bed is laid and ensure a smooth curve.



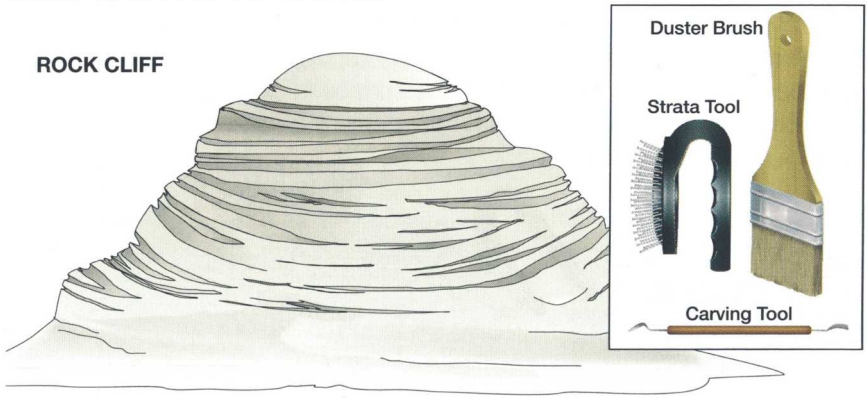
ROCKS

The next step for building terrain is to install rocks. Rocks in the natural world vary widely in color, shape and texture depending on how they were formed (igneous, sedimentary or metamorphic). Granite, for example, is an igneous rock and tends to be spotted with colors that vary from pink to green. Sandstone, however, is a sedimentary rock that has visible strata (layers) in different colors ranging from grey to light tan or red. Research the rock formations found in the area you are modeling. This will help you decide which colors and shapes of rocks you want on your layout and which product will suit your needs.

There are many ways to add rocks to your terrain. You can carve rocks directly on the terrain shell, create your own rocks with Rock Molds, use pre-made Ready Rocks or make your own rock molds with Latex Rubber. Installation methods are included at the end of this section, and Chapter 3 will address how to color rocks.

CARVING PLASTER ONLINE VIDEO

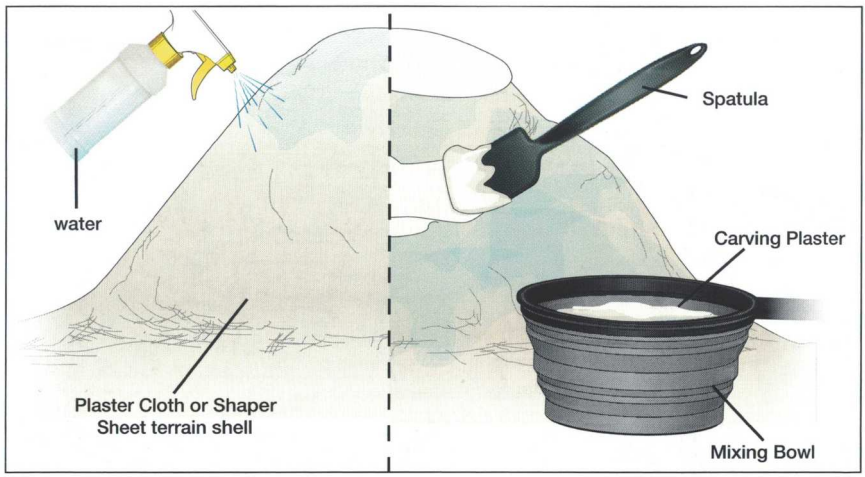
Carving Plaster allows you to carve any object directly onto a hard shell made of Plaster Cloth or Shaper Sheet. With Carving Plaster and Easy Rock Carving tools, you can carve a rock cliff, cobblestone street or boulders directly onto the layout's terrain contours. This is the easiest and fastest way to create large, textured expanses while also maintaining artistic control over the outcome.



Mixing and Applying Carving Plaster

Mix Carving Plaster according to the package instructions. Then apply it to a Shaper Sheet or Plaster Cloth base. Apply Carving Plaster in layers a minimum of 1/4" thick. Mist the plaster terrain shell with water before application for the best adhesion between the hard shell terrain and wet plaster.

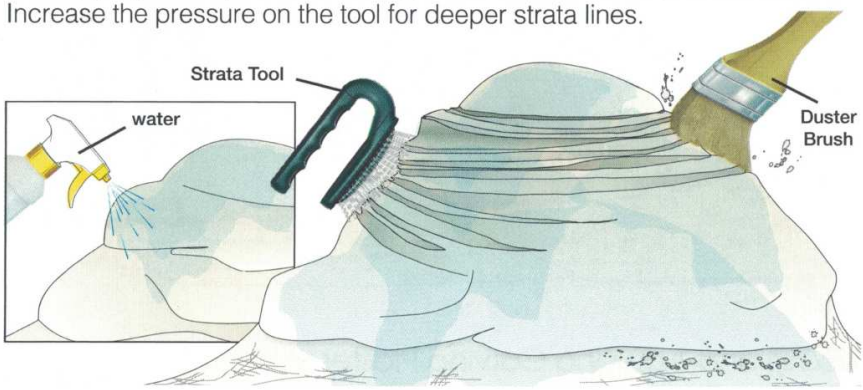
Spread Carving Plaster on the terrain shell. Apply thick layers for deep, realistic strata lines. Apply in mounds for large boulders and rock shelves. Allow Carving Plaster to dry 24 hours before carving. More Carving Plaster can be added at any time if you make a mistake or need additional plaster.



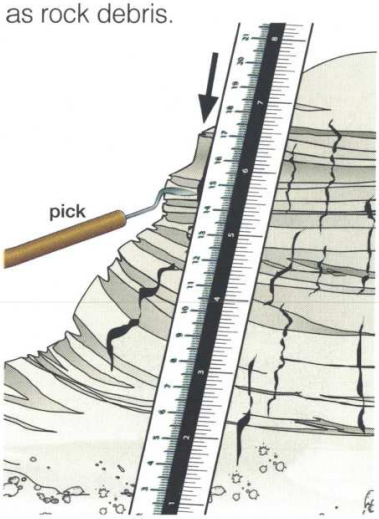
Carve the Plaster

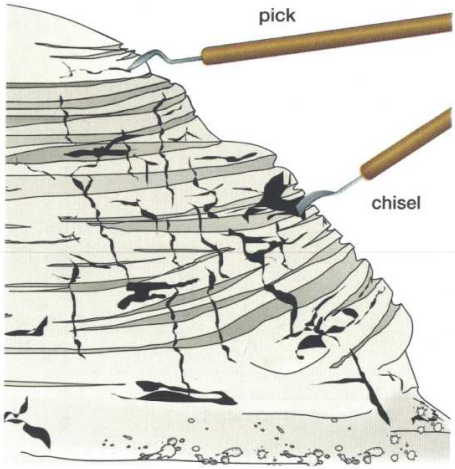
Before you begin, spray the dry Carving Plaster with water. The water will soften the plaster for easy carving and reduce plaster dust. Then, use Easy Rock Carving Tools to carve and shape rock formations. Easy Rock Carving Tools include a Strata Tool, Carving Tool and Duster. Periodically spray the plaster with water while you are carving. Use the Duster to brush away dust and debris from the surface while you are carving in order to view your progress.

The Strata Tool is used to model strata, blasted rock and other weathered outcroppings. Scrape the tool along the surface to develop strata lines. Increase the pressure on the tool for deeper strata lines.



The dual-sided Carving Tool contains a chisel and pick. Use the Chisel-end to carve gouges, rock chunks and model rock breaks. Add cracks, fissures and deepen striations with the pick-end of the Carving Tool. Scrape the pick-end across the rock face in random patterns to score grooves and fine-line abrasions. Use these tools with a ruler to create evenly spaced and realistic blast lines. Save any leftover chunks of Carving Plaster to use later as rock debris.





ROCK MOLDS

Cast highly-detailed rocks with reusable Rock Molds and plaster.

Product Overview

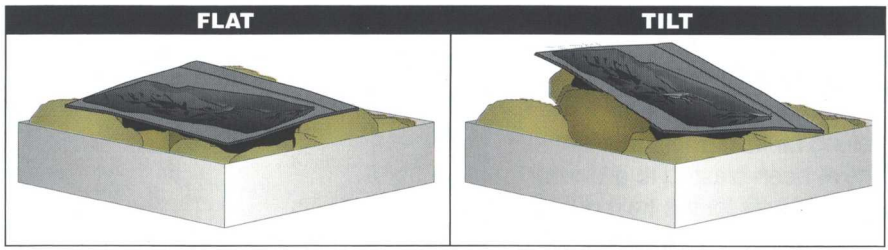
Rock Molds

Rock Molds are made of a flexible, durable, rubbery material that has been shaped into the form of a variety of rocks. Each provides a different texture and appearance that can be used in different types of terrain. For the best results, use Lightweight Hydrocal®, Shaper Sheet Plaster or Super Strength Plaster to cast rocks with Rock Molds. Lightweight Hydrocal is often chosen for its light cure weight and short working time. We will use Lightweight Hydrocal for an example in this section.

Support the Rock Mold

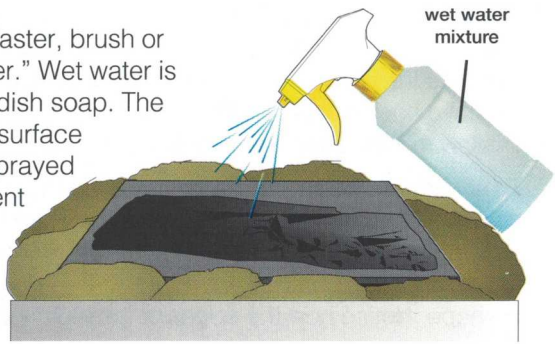
Make sure the Rock Mold will be properly supported before pouring plaster. The molds are rubber and the rock faces are uneven, so they may not sit upright on a table when the plaster is added to it. Support the mold with sand or a box filled with newspaper. Nestle the mold into the sand or newspaper so the edges are supported and the top of the mold is level.

This method of support can also be used to distort the rock's face. To distort and create custom rocks, tilt the mold in any direction and then pour your plaster in. Keep the tilt supported while curing. This will result in a smaller but differently shaped rock.



Prepare the Mold

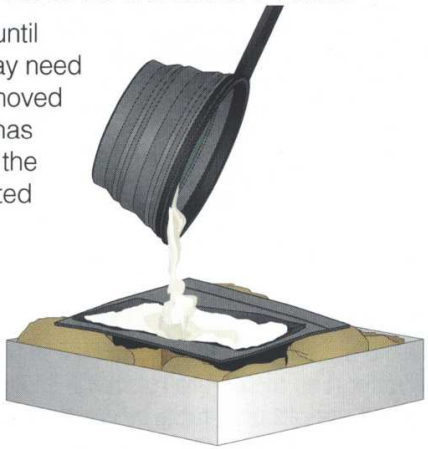
To prepare Rock Molds for plaster, brush or spray the mold with "wet water." Wet water is a mixture of water and liquid dish soap. The liquid dish soap reduces the surface tension of the water. When sprayed in a Rock Mold, it helps prevent bubbles developing in the plaster. To make wet water, mix 2 drops liquid dish soap in 1 cup water.



Cast Your Rocks

Following the mixing instructions on the package, pour Lightweight Hydrocal slowly into cold water. Let the plaster stand for two minutes in the cold water. This helps ensure a good casting. Then stir for 1 to 2 minutes. Pour the plaster into the mold immediately. Lightly tap the edges of the mold to dislodge any bubbles and ensure the plaster seeps into all the crevices of the mold.

Let cure approximately 40 minutes or until completely hardened. Larger rocks may need more cure time before they can be removed from the mold. You will know the rock has set and hardened when the surface of the plaster looks chalky. If you have distorted the mold and made a thin or curved casting, leave the casting in the mold overnight before removing it. This will prevent cracking and crumbling.

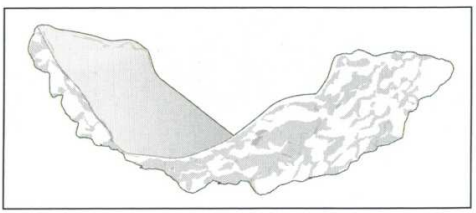


Color rocks only after they have dried overnight (Chapter 3).

ALTERING ROCK SHAPES

Any plaster rock can be altered for custom fit on a layout. You can alter the Rock Mold before the plaster is poured, or you can make alterations to the rock after it has been removed from the mold.

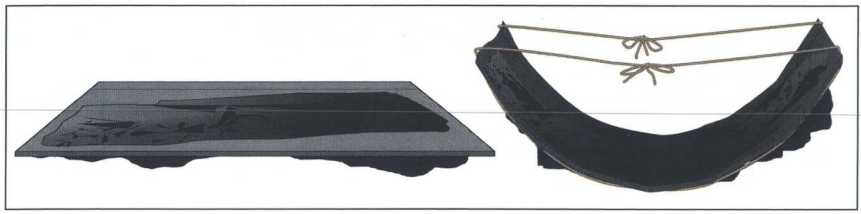
Curved Rock Faces



Roads and railroads often run along bluffs or rock cuts that have been blasted to allow the right-of-way for the train or road. Many bluffs have a natural curve to them, and rock cuts can be blasted in a curved shape. It is easy to recreate these curved, bald, rock faces using Rock Molds. You can bend the mold into a wide U-shape and keep it bent while the plaster in the mold sets and cures. The U-Shape will force the plaster to cure with a realistically curved front face, and the concave back will fit snugly on curved terrain. This method works best for shallow molds. Deep molds may be difficult to bend into a curve.

To secure the mold in a U-shape, you can use clamps or heavy objects to hold the mold in place--or you can simply use some string. Wrap a piece of string around the outside of the mold and pull the ends together until the mold has the curve that you want. Tie the ends together to secure the U-shape. Notice how the edges of the mold indent a bit where the string

stretches across the front face of the mold. Add another piece of string and stretch it so it holds some weight of the mold and then tie it in place. Space the pieces of string evenly on each end of the Rock Mold.



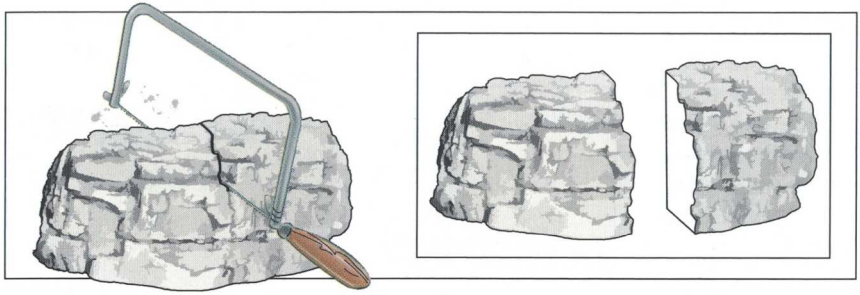
Once you are happy with the shape of the mold and it is held firmly in place, mix the plaster to a paste-like consistency. Apply the plaster by pushing the plaster into the vertical curved areas with a craft stick or brush. If using string to hold the mold in a U-shape, you can also roll the mold to the left and right and let the plaster ooze into the vertical corners. Let cure overnight before removing the rock from the mold. Peel the Rock Mold off of the rock gently.

Shaping Rock Faces

After a rock is removed from the Rock Mold, you can easily adjust the rock's face using the Easy Rock Carving Tools. It is easiest to carve into a rock right after it has been removed from the mold because the plaster is still soft and pliable. Lightweight Hydrocal® is easiest to carve when it is not fully cured. If your rock is completely dry, soak or mist it with water before carving. This will help soften the rock and reduce plaster dust.

Cutting Rocks

After they have fully cured, rocks can also be cut to smaller sizes using a hacksaw. This is helpful when you need a rock with a clean edge. You can also break rocks into smaller pieces for unique rock shapes. Use the leftover broken debris as rock debris.



MOLDS WITH LATEX RUBBER ONLINE VIDEO

Making your own molds is the ideal way to add unique rock formations to your layout or model rock formations typical of a specific area.

Product Overview

Latex Rubber

With Latex Rubber, you can create molds of rocks that you find in the field. Latex Rubber is ready-to-use and formulated to be thin enough to seek detail and thick enough to be durable for multiple castings.

Preparation

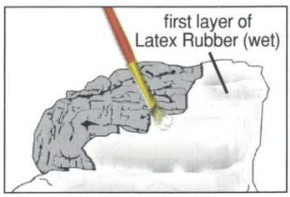
Remove any dirt, dust or residue from the object you are casting before applying Latex Rubber. Wash the object, or rock, in warm soapy water and let dry completely before application.

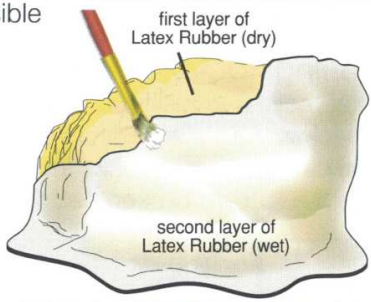
Latex Rubber can get stuck in a paintbrush easily if allowed to dry on the bristles. Keep a cup of soapy water nearby so you can soak the brush between layers. When you finish applying the Latex Rubber, wash the paintbrush with warm soapy water immediately. Use a wire brush to help clean bristles. These simple steps will save the paintbrush for future use.

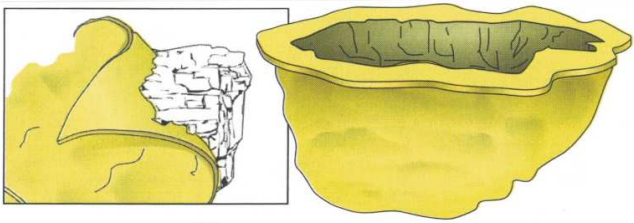
The mold will need to be removed from the object after the Latex Rubber has dried. Pick the side of the object that you do not care to have cast. Leave this side free of Latex Rubber so that the object has an exit from the mold once the mold is dry.

Making a Mold

To make a mold, paint a layer of Latex Rubber on the object of your choice. Be sure to push the Latex Rubber into all the cracks and crevices of the rock or object. You do not want to leave any air bubbles between the rock and the Latex Rubber or the bubbles will be visible in your casting. One layer of Latex Rubber takes approximately 30 minutes to dry. When dry, it will appear pale yellow and slightly translucent. Once it has dried, you can apply another layer. Always allow the previous layer to dry before applying another. If only a few castings are planned from an individual mold, we recommend a total three layers of Latex Rubber. When the three layers are dry, carefully peel the finished mold off the rock. The mold is now ready to cast.

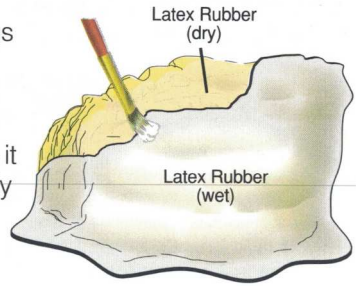


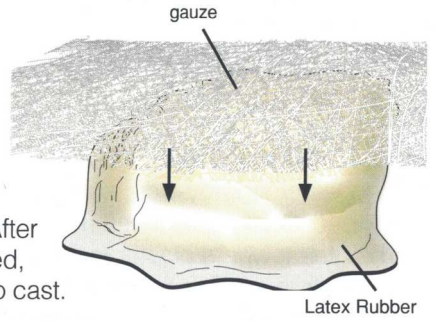


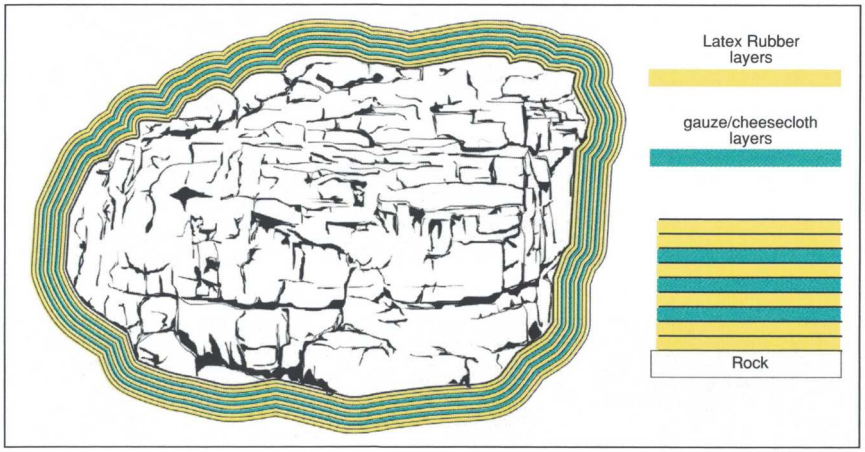


Making Reinforced Molds

If you plan to make a large number of castings from the mold, place a strip of gauze or cheesecloth between layers. The cloth will make the mold thicker, more durable. Do not use a stretchable material like nylon because it will allow the mold to stretch and distort. Apply the first layer of Latex Rubber and let it dry, then apply a second layer. Press the gauze into the second layer of Latex Rubber when the layer is wet. Work the gauze into all the cracks and crevices, and allow the layer to dry. Then apply another layer of Latex Rubber and add another strip of gauze. Repeat this process one more time. Finish the mold by painting on two layers of Latex Rubber without adding gauze. After the final layer of Latex Rubber has dried, peel the mold off the rock. It is ready to cast.

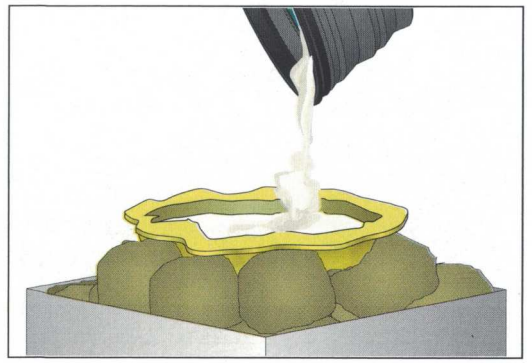






Support the Mold

Pour the plaster into the Latex Rubber mold following the instructions in the Rock Molds section (pages 81-83).



READY ROCKS ONLINE VIDEO

If you do not want the mess of pouring plaster, there are other options.

Product Overview

Ready Rocks™

Ready Rocks are highly detailed plaster castings that are hand-painted with Earth Colors Liquid Pigment. Each Ready Rock is unique and ready to place on your layout right out of the package. Ready Rocks are perfect for modelers who do not want to cast and paint their own rocks or only need a few rocks to complete a project.

Shelf, Rock Face, Creek Bed and Creek Bank Ready Rocks are cast to nest together side-by-side, so you can make a seamless rock wall or creek bed. Sometimes these nesting rocks may have mold flash, which is a small seam where plaster leaked out of the mold. Use 80-grit or 120-grit sandpaper to sand this excess plaster off for the best fit. If white spots occur, use a wash (page 112) or pencil to color the white spot in. Smudge the pencil mark with your finger to blend in with the rest of the colors.

ROCK FACE

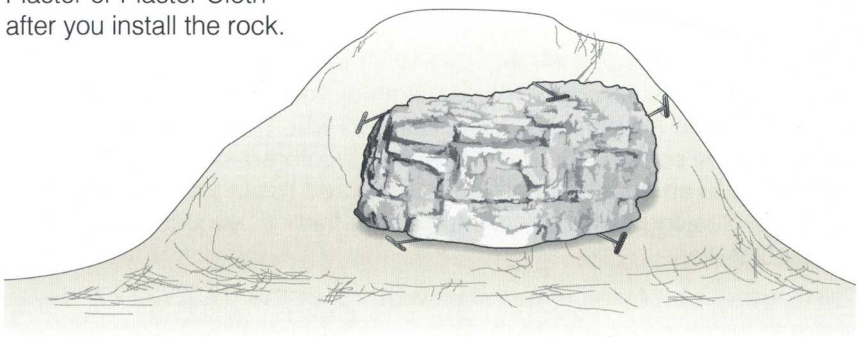
INSTALLING ROCKS

Rocks can be installed on the layout once you have built your terrain contours, or they can be added as details to a more complete layout. Fasten rocks to a plaster surface with Lightweight Hydrocal®, Super Strength Plaster, Shaper Sheet Plaster, wadded Plaster Cloth, Scenic Glue or Foam Tack Glue.

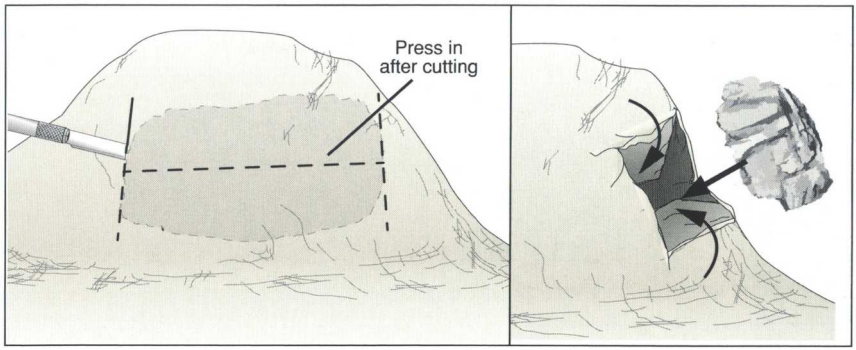
Color rocks before or after installation. If you choose to color them after, take care to not allow the adhesive to drip onto the colored rock's face as it will affect the coloration and require touch up work.

INDIVIDUAL METHOD

To attach rocks to your layout individually, make several in advance and then test fit them against the terrain shell. If you want to test the rock's fit, make a temporary shelf to prop the rock on with Foam Nails. Insert Foam Nails into the terrain shell under the bottom edge of the rock to make the temporary shelf. There will be some space, or a gap, between the rock and the terrain shell. This gap is normal and will be filled with additional Plaster or Plaster Cloth
after you install the rock.

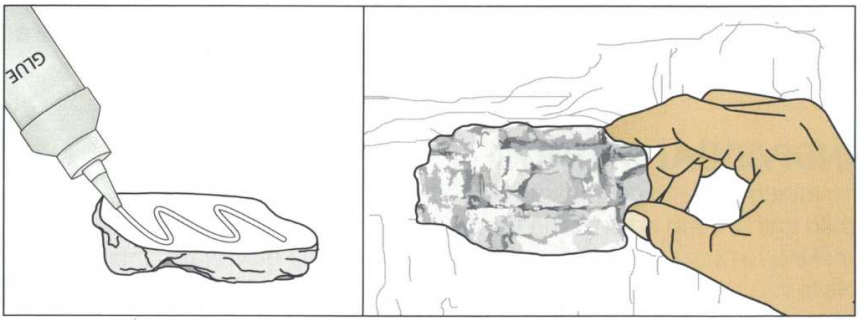


If you can't find a good fit for a rock against the terrain shell, cut the terrain shell and recess the rock. This will not affect the integrity of the terrain shell; it will only ensure you have the rock where you want it. Cut the terrain shell in an H shape and press the two interior sections of the terrain shell until they give and create a shelf, as shown.



Install with Glue

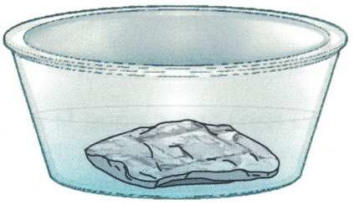
To attach rocks with Foam Tack Glue or Scenic Glue, spread the glue on the back of the rock and place it on the terrain. Hold in place until setting begins. If the rock is on an overhang, use some Foam Nails to support it as the glue dries. Use glue as adhesive when you are installing individual rocks that have a tight fit against the terrain.

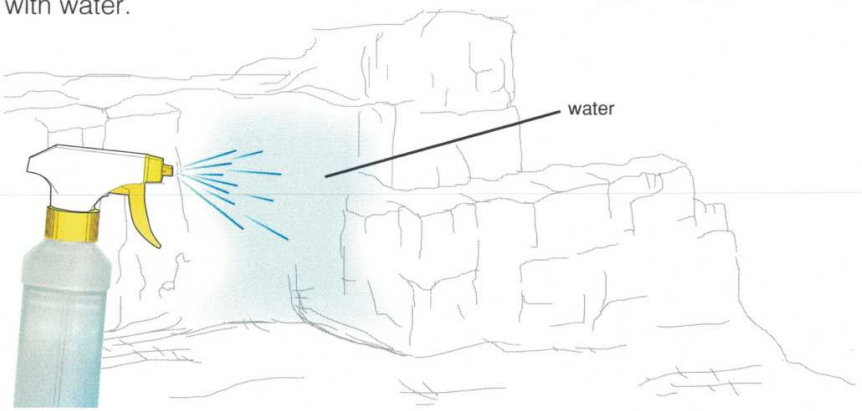


Prepare Rocks for Installation with Plaster

Rocks can be installed with Plaster Cloth or additional Plaster, but the rock should be prepared for installation first. Prepare a rock for installation by soaking the rock in water. Uncolored rocks can be soaked up to an hour, but do not soak colored rocks for more than 10 seconds. Soaking colored rocks for longer than 10 seconds can lead to discoloration.

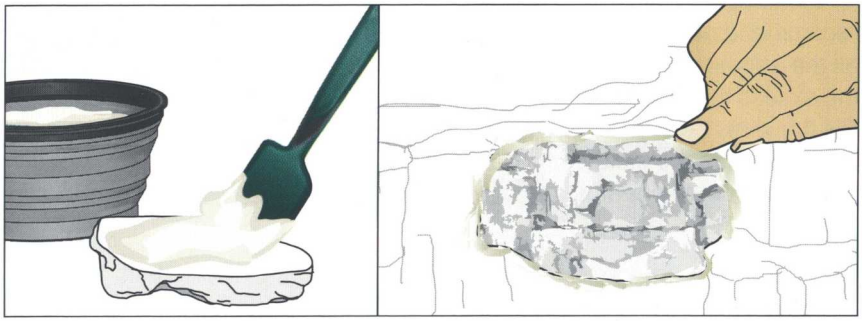
Then, spray the plaster terrain shell with water to begin your installation. This ensures the rock bonds with the fresh plaster or Plaster Cloth. If either the terrain or the rock begins to dry during installation, mist them with water.





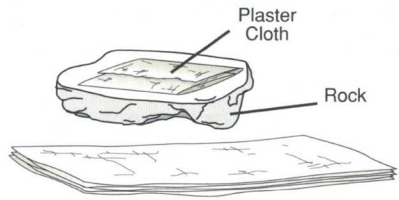
Install with Plaster

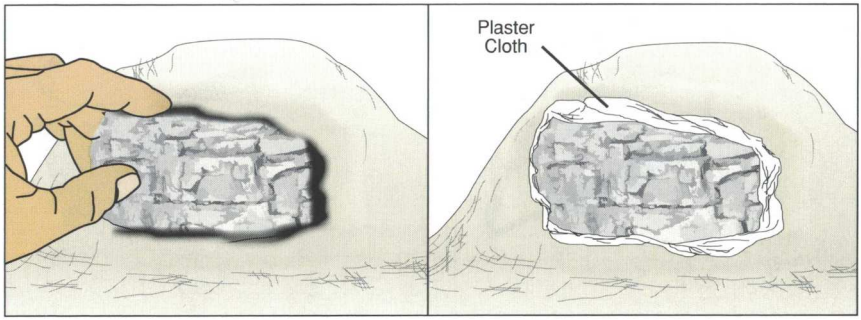
To install rocks with plaster, begin by mixing a batch of thick plaster (see page 64). Apply the plaster to the back of the rock and then place the rock on the terrain. Hold the rock in place until setting begins. Some plaster may ooze from behind the rock. Use this excess plaster to fill the gap between the terrain shell and the rock. With wet fingertips, smooth the excess until there is no gap. After it dries, if excess remains, you can chip it off. Use plaster as the adhesive when you know there will be small gaps between the terrain and the rock or when installing multiple rocks to create a rock cliff.



Install with Plaster Cloth

To install rocks with Plaster Cloth, cut it in strips approximately 2" wide x 4" long. Fold or wad one of these strips up in a ball and place it on the back of the rock. Spray the Plaster Cloth with water and then place the rock on the layout. Hold in place until it begins to set. To fill the gaps between the layout and the rock, tuck dry Plaster Cloth strips into the crevices and then spray with water. Tuck and shape the Plaster Cloth until there is no visible gap between the layout and the rock. Plaster Cloth has more body than plaster, use it to install rocks in areas where the terrain shell is uneven and needs to be built up for a good fit with the rock.

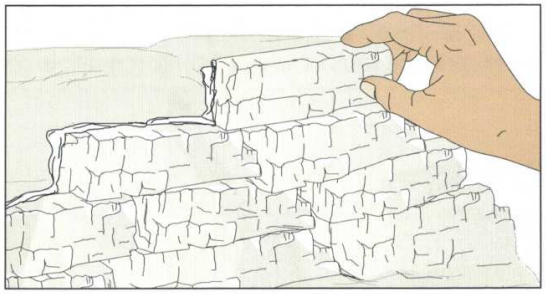




BRICK METHOD

Use the Brick Method to create highly-detailed, expansive rock faces and cliffs with individually cast rocks. The brick method is exactly how it sounds: fitting rocks together like bricks. Unlike bricks, which have even, flat sides that easily nest together, not all edges of the rocks will nest perfectly right away. You can, however, make them nest. Simply rub the edges of two rocks together. They will sand each other into a fit.

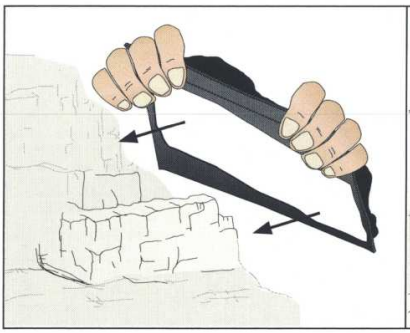
Install rocks tightly together using plaster for the adhesive. We recommend using plaster as the adhesive because the excess that oozes out fills the joints between the rocks. Smooth the excess plaster with wet fingertips.

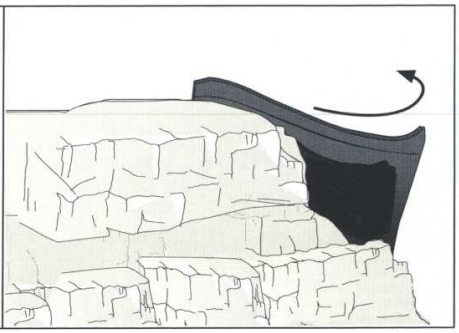


SHINGLE METHOD

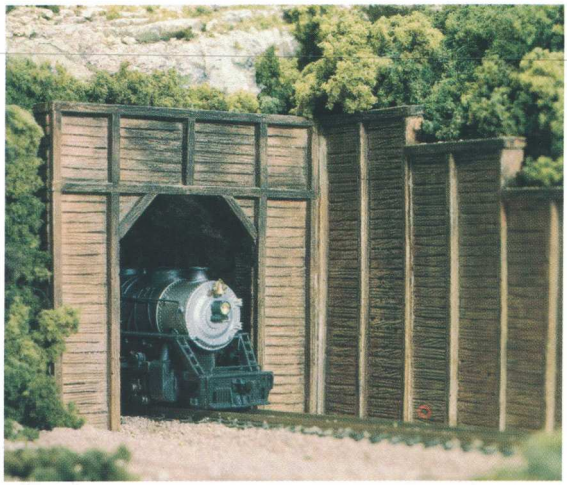
The shingle method of installation involves using the plaster in the Rock Mold as its own adhesive to attach the rock to the terrain shell. This method requires no additional plaster to attach the rocks; however, the rock mold must stay attached until the rock is dry in the mold. Each new rock that is added is shingled over the edge of its neighbor. A second rock cannot be added in the same area until the first is dry and its mold removed. This is a slow-working process, but it can create very realistic rock areas without obvious joints between the rocks.

Pour only one or two rock molds at a time when shingling. When the plaster is poured into the mold, it will look wet and shiny. When it is dry, it looks dull and chalky. Install the mold on the layout when the plaster looks pasty. Wet the terrain with water, then place the Rock Mold on the layout and hold it in place until it sets and is firmly attached. Leave the mold in place on the layout for at least 30 minutes, then peel it off carefully. Fill any gaps between rocks and the layout as described previously.



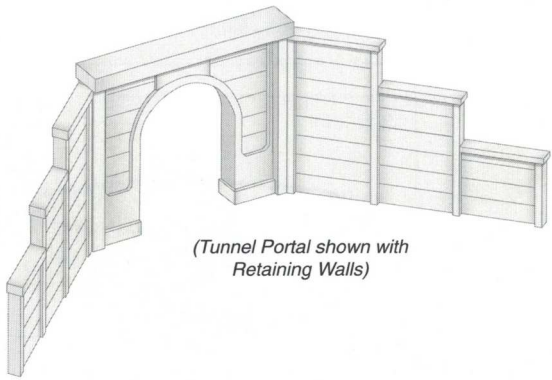


TUNNEL PORTALS, RETAINING WALLS AND CULVERTS ONLINE VIDEO



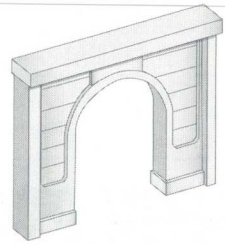
Tunnel Portals, Retaining Walls and Culverts are made of high-density plaster, which can easily be stained or detailed further. Each one goes in a different location in relation to tracks or roads. Tunnel Portals are placed at tunnel openings to provide a realistic facing for tunnel entrances. Retaining Walls are used to stop rocks and dirt from falling on the track along steep terrain. Culverts are drains on either side of a road or track. They help direct water by diverting it under roads and railroad tracks.

Tunnel Portals, Retaining Walls and Culverts are all installed in the same manner as rocks. See the Installing Rocks section (page 87).

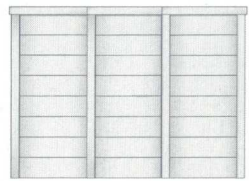


(Tunnel Portal shown with Retaining Walls)

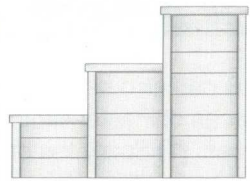
TUNNEL PORTAL



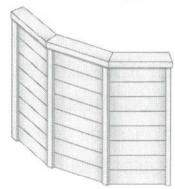
RETAINING WALL



Straight Walls

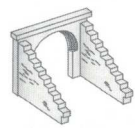


Stepped Walls



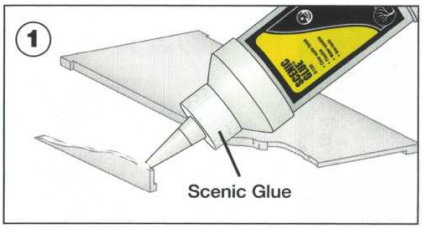
Curve Walls

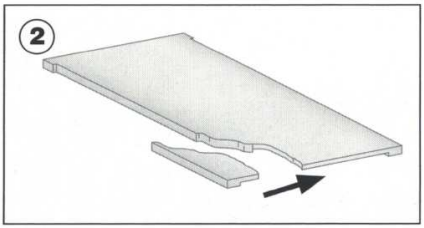
CULVERT



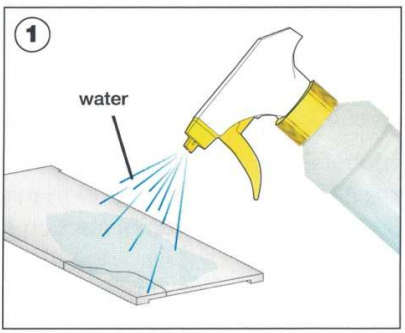
Repair Tunnel Portals, Retaining Walls and Culverts

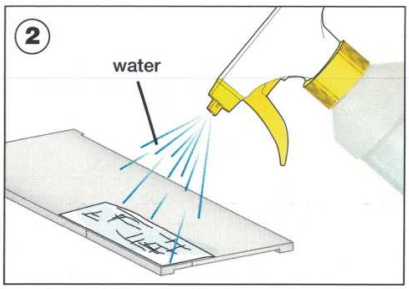
The plaster pieces are very durable, but are not unbreakable. Repair breaks with Scenic Glue. **(1)** Apply the glue to both sides of the break then **(2)** press the pieces together. Hold until it sets.

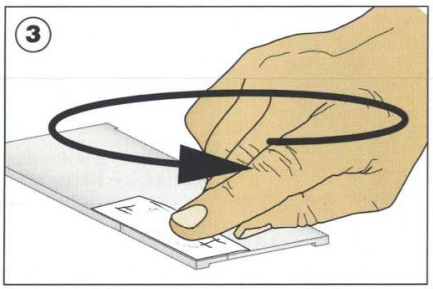




You can also use a couple small pieces of Plaster Cloth to repair a break. **(1)** Spray the broken pieces with water then place the Plaster Cloth along the back of the broken pieces. **(2)** Spray the Plaster Cloth with water and **(3)** spread the plaster with wet fingertips (hold the pieces together tightly). Layer another piece of Plaster Cloth over the first. When dry, the piece can be installed.







ROADS

Roads come in a variety of shapes, sizes and styles depending on the location and time era you have chosen for your layout. Whether you're modeling a gravel road in the country, an asphalt highway or a concrete sidewalk, the Road System has everything you need.

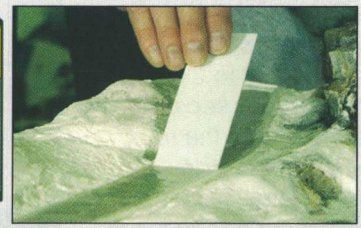
Product Overview

Paving Tape™

Paving Tape is an adhesive-backed foam tape that is used to create forms for paving. It works on straight roads, as well as curves, and is easy to apply and remove. Use Paving Tape to model streets, roads, sidewalks and parking lots.

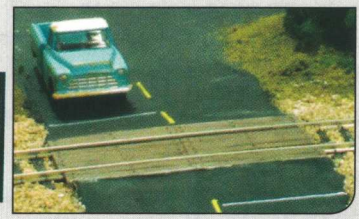
Smooth-It™

Smooth-It is a plaster material that is used to smooth rough spots and create streets, roads and parking lots. Just mix it with water and apply directly to any clean, hard surface, then sand and paint. Smooth-It is easy to apply to new and existing layouts. You can use Smooth-It on Plaster Cloth, Shaper Sheet Plaster, Foam Sheets, Homasote and plywood.



Grade Crossings

Grade Crossings come in two styles (Wood and Steel) and are available in N, HO and O scales. These realistic-looking and ready-to-place Grade Crossings have notches to fit over rail spikes and the included styrene shims correspond to proper code.



ROAD PLACEMENT

In the countryside, roads are frequently built parallel to railroad tracks and are often gravel. In mountainous areas, roads generally follow the valleys rather than climbing to the top of each mountain. When they do climb a mountain, they often climb in tight hairpin curves or switchbacks. In cities and towns, roads are parallel to tracks. They also cross tracks to provide access to businesses and industries for workers and customers. Roads in cities and towns also tend to be paved.

Remember that roads, like railroad tracks, are built for a purpose. They connect towns, provide access to industries and give people a route to get to their homes. When you design roads, you must also design places to put the cars and trucks that travel on them. So, be sure to include parking areas by houses and industries.

SCALE

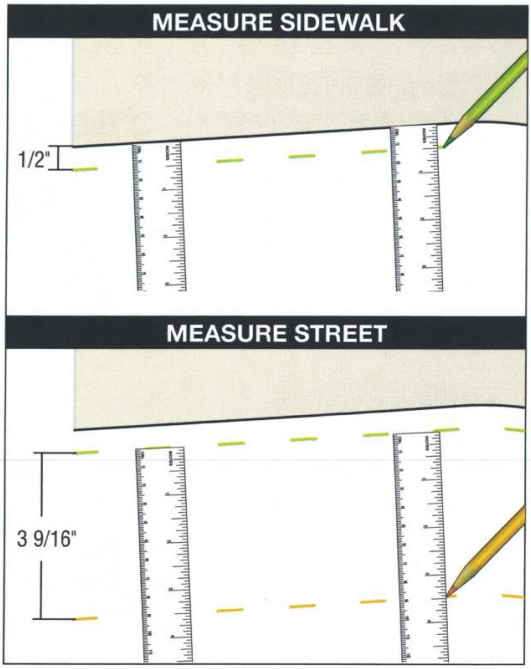
The first step in making a road is determining how wide it should be. Use the chart below to determine the width that you need to make your road.

SCALE	CITY STREET 26' (7.92m)	COUNTRY ROAD 20' (6.09m)	HIGHWAY LANE 11' - 12' (3.35m - 3.65m)	SIDEWALK 4' (1.21m)
N	1 15/16" (4.92cm)	1 1/2" (3.81cm)	13/16" - 15/16" (2.06cm - 2.38cm)	5/16" x (0.79cm)
HO	3 9/16" (9.04cm)	2 3/4" (6.98cm)	1 1/2" - 1 5/8" (3.81cm - 4.12cm)	1/2" (1.27cm)
O	6 1/2" (16.5cm)	5" (12.7cm)	2 3/4" - 3" (6.98cm - 7.62cm)	1" (2.54cm)

DRAWING ROADS

With a Foam Pencil, draw the outline of your road on the layout. If you plan to include a sidewalk, be sure to add it to the overall width. Draw a separate line to show where the road stops and the sidewalk begins. The trickiest part of drawing out a road is the curves. Use the Flexi Edge (pages 109-110) to hold a curved line or use a ruler to measure the width as you draw.

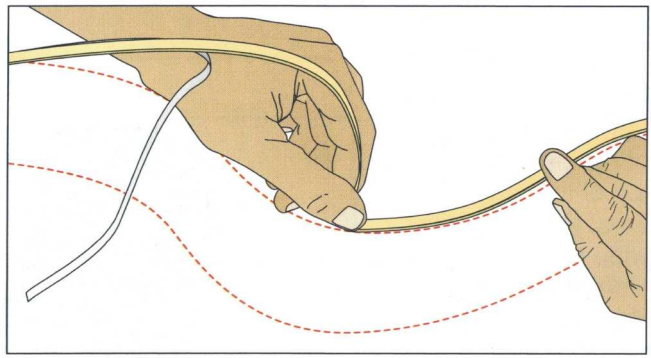
Creating Gravel Roads will be discussed in Chapter 3 (page 108). Continue reading to create paved areas.



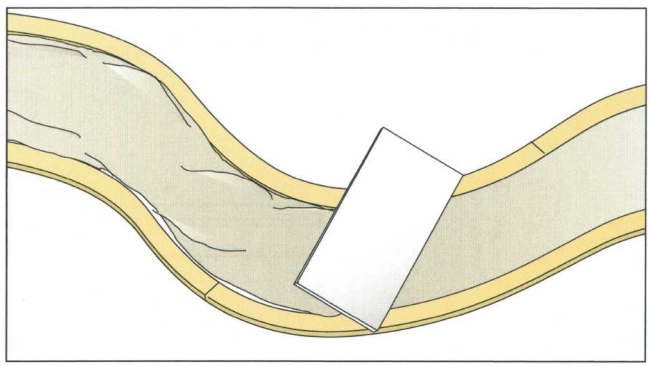
CREATING PAVED AREAS ONLINE VIDEO

Smooth-It is used to create paved areas. It can be applied with or without Paving Tape, which acts as a form and creates clean edges for the sides of the road. Skipping the Paving Tape may cause Smooth-It to have irregular edges. If you choose to use Smooth-It without Paving Tape, simply mix and apply.

To make a road using Paving Tape, start by laying the Paving Tape in small increments along the outer edges of the road's drawn outline. Peel the protective backing off the Paving Tape a few inches at a time. Once the Paving Tape is in position, press it down firmly. When you reach the end of your road, cut the Paving Tape and repeat the process on the other side of the road. If you are making a parking lot or other area, lay Paving Tape on all sides of the area you want to be paved, butting the ends together so that the Paving Tape creates a little wall that will contain the wet Smooth-It. Lay masking tape down along all outside edges of the Paving Tape. This will protect against spills and can be peeled up easily after Smooth-It has dried.



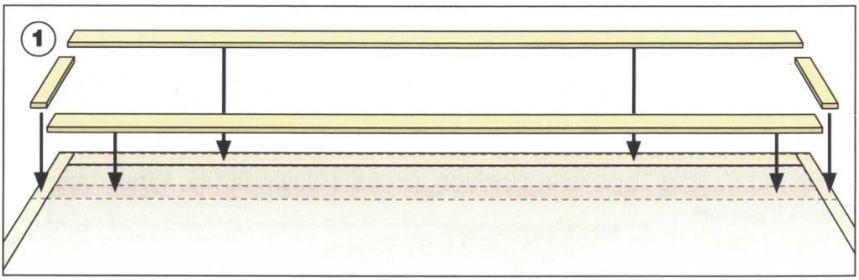
Mix a batch of Smooth-It according to package directions. Pour the mixture between the Paving Tape. Then use the Spreader included with the Paving Tape to level the Smooth-It. Use the top edge of the Paving Tape as a leveling guide. Do not apply pressure to the Paving Tape when spreading the Smooth-It.



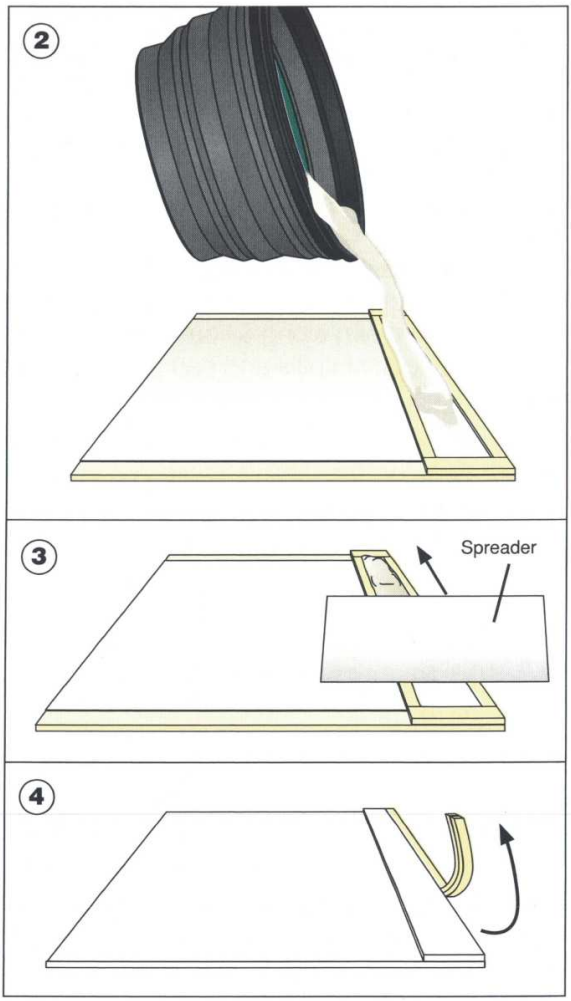
For areas without a sidewalk, you can remove the Paving Tape after drying for 30 minutes. Allow the Smooth-It to dry for 24 hours and proceed to the Finishing Paved Areas section on page 109 for painting and weathering techniques.

CREATE SIDEWALKS AND CURBS ONLINE VIDEO

Allow Smooth-It in the paved area to dry for at least 1 hour before beginning a sidewalk. For sidewalks and curbs, lay a strip of Paving Tape over the existing strip (or strips) beside the road you've just created.



Lay another piece of Paving Tape on top of the paved area, leaving a gap wide enough for the sidewalk or curb. Spread Smooth-It between the strips of Paving Tape and allow it to dry for 30 minutes. Do not leave Paving Tape in place any longer than necessary. Carefully pull Paving Tape away from the Smooth-It.



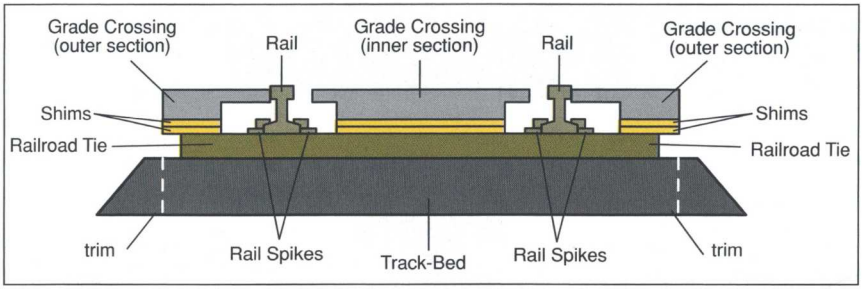
ROAD CROSSINGS ONLINE VIDEO

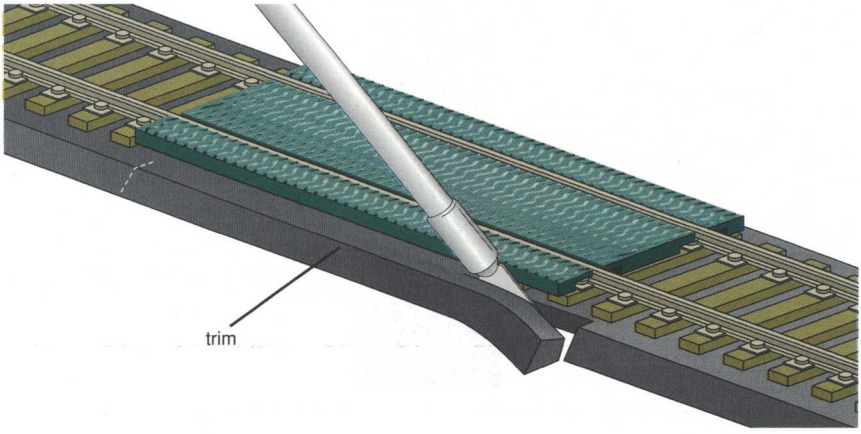
Road crossings are necessary wherever a street or road crosses railroad tracks. First, determine the width and position of the road and draw it onto the terrain shell. Once the position of the road has been determined, install the Grade Crossing where the road will be crossing the railroad tracks. To build a proper road crossing, you will need to install a Grade Crossing and then adjust the road's height with an Incline/Decline or Smooth-It to match the height of the Grade Crossing.

Installing Road Crossings

To begin installation, check the fit. Place the Inner Section of the Grade Crossing on top of the ties, centered between the rails so there is enough space for the train wheel to pass through. Check the height. The height of the Grade Crossing pieces should be slightly lower than the top of the rails. If the Inner Crossing is too low, use the included Shims to bring the Grade Crossing closer to the height of the rails. Glue the Inner Section in place with super glue. Then, install the Outer Sections of the Grade Crossings.

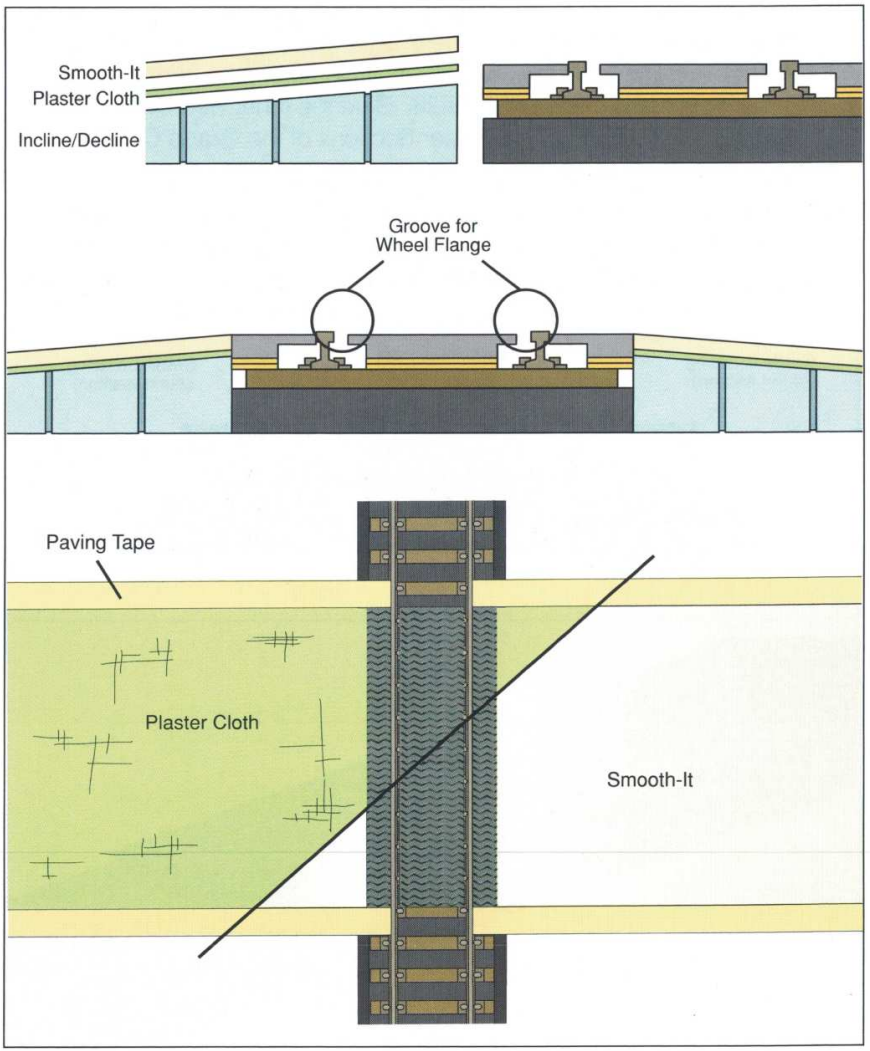
The Outer Sections of the Grade Crossings are designed with a lip that allows them to be placed over the top of the rail tie spikes. Install the Outer Sections flush against the outside of the rails on both sides of the track. The Outer Sections should be the same height as the Inner Section, so use the Shims to raise the height, if needed. Glue in place.





Raising Road Height

Once the Grade Crossings have been installed, it is time to raise the road's height to the height of the installed Grade Crossing. To do this, notch the Track-Bed flush with the Outer Section of the Grade Crossing. Then, cut an Incline/Decline in the appropriate length and height. Cut the Incline/Decline slightly lower (1/8") than the height of the Grade Crossing to allow for the Plaster Cloth and/or Smooth-It to be installed so the height of the road will match the Grade Crossing. Butt the Incline/Decline against the Outer Sections of the Grade Crossings and install as described in the SubTerrain Chapter. If railroad ties are longer than Outer Section, notch the Incline/Decline to fit. Then, cover the Incline/Decline with Plaster Cloth and finish the road with Smooth-It and Top Coat.



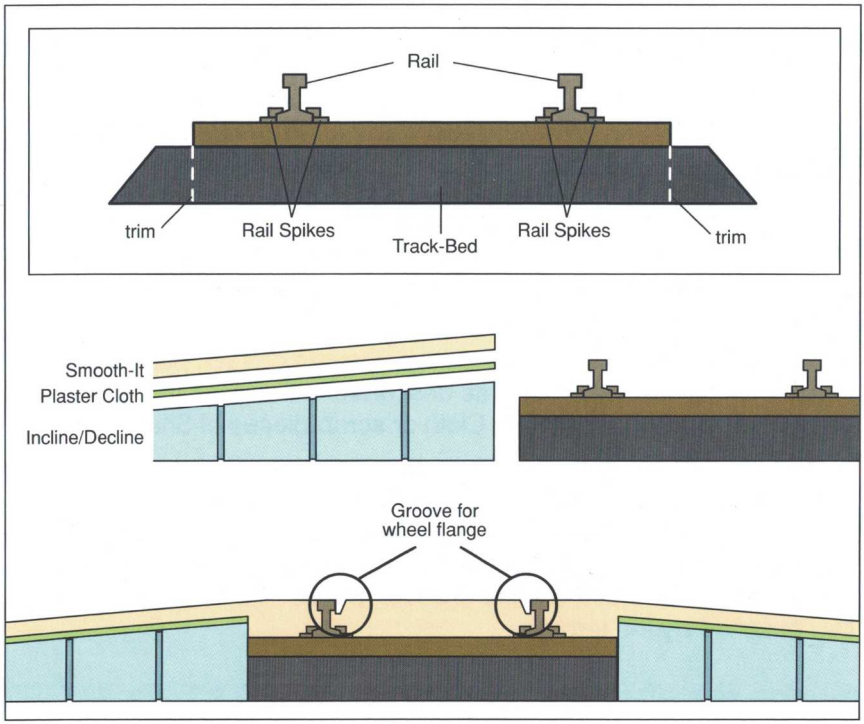
Smooth-It (Paved) Road Crossings

Some rail crossings are made of concrete or asphalt. The asphalt and concrete completely covers the railroad ties and provides an even, continuous surface for vehicles to cross. This kind of crossing is common in large cities where trains are used for commuting.

To create paved crossings, begin by notching the Track-Bed on both sides of the rails so it is flush with the railroad ties. Notch the Track-Bed only as wide as the road. To create a large concrete or asphalt area, notch the Track-Bed the entire length of the area that will be paved.

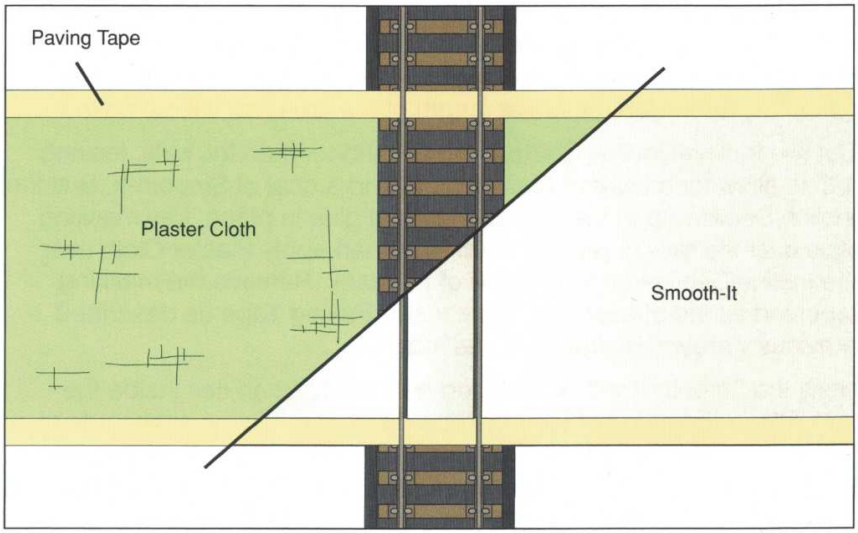
Cut two Incline/Decline Starters slightly shorter than the rails, leaving 1/8" to allow for a layer of Plaster Cloth and a coat of Smooth-It. Butt the Incline/Decline up to the railroad ties and glue in place. Lay masking tape over the rails to protect them, and then apply Plaster Cloth over the Incline/Decline on both sides of the track. Remove the masking tape and let the plaster dry. Then, install Paving Tape as described previously around all edges of the road.

Next, the Smooth-It will be installed over the railroad ties inside the rails. Place two strips of Paving Tape inside the rails on either side of the area that will be paved. Then lay thin strips of masking tape over the rails to protect them. Apply Smooth-It on both sides of the rails and between the rails. Wipe rails free of Smooth-It with a wet cotton swab and allow Smooth-It to dry.



Once dry, use a hobby knife and ruler to score a groove in the Smooth-It on the inside of each rail. This will allow the train's wheels to pass through the road crossing.

Finishing and weathering the surface of the road will be discussed in Chapters 3 and 4.

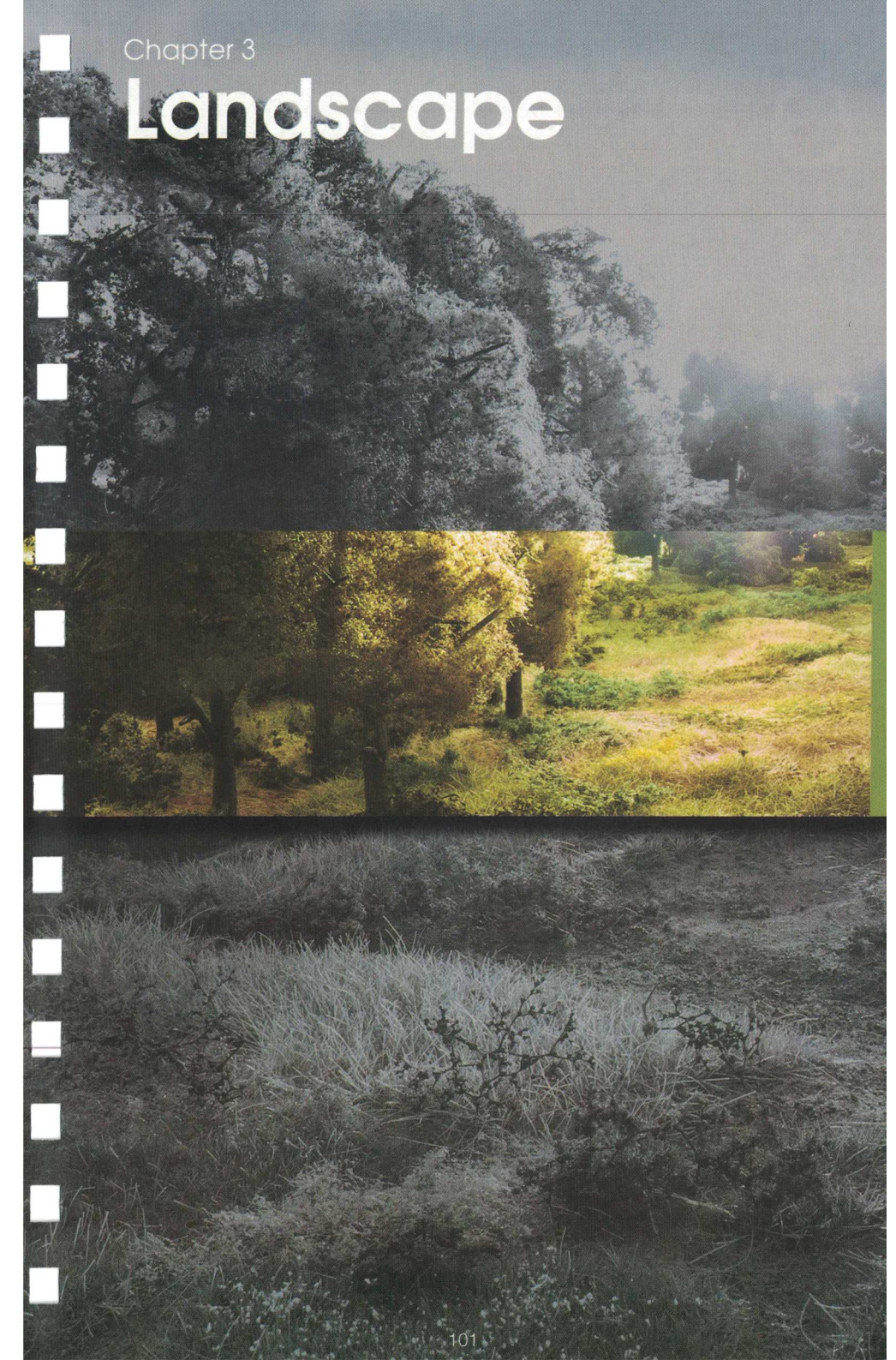


REPAIR TERRAIN GAPS

Before landscaping, check your layout thoroughly for any gaps in the terrain. If you find any gaps, cracks or areas where you don't like the terrain contours, you can fill these areas with Lightweight Hydrocal®, Shaper Sheet Plaster or Plaster Cloth.

If a terrain contour will interfere with your layout or track plans, remove the contour with a hobby knife as described in the Rock Installation section (page 87). Use Plaster Cloth or scrap pieces of Shaper Sheet to form the new contour.

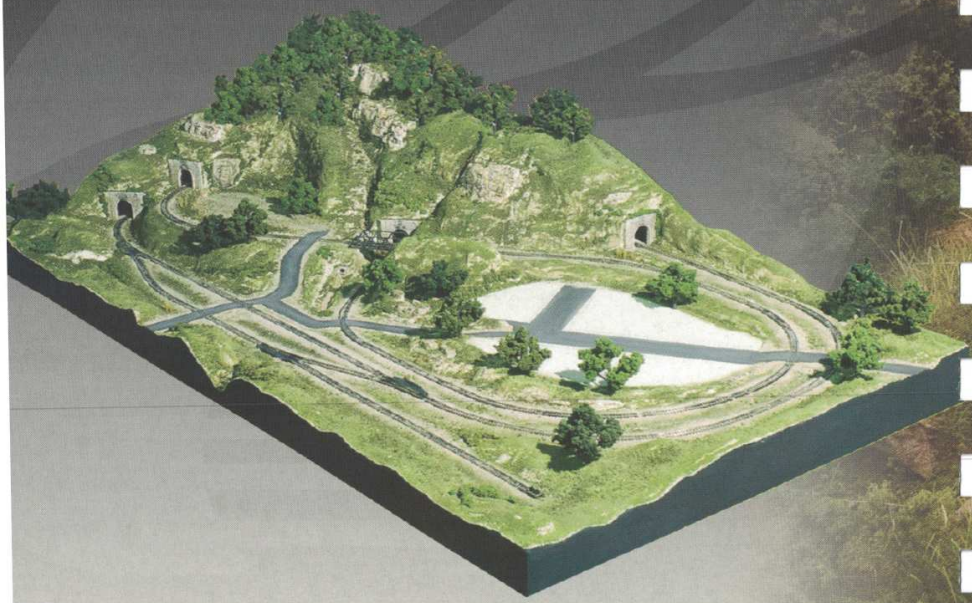
Now is a good time to add any features you may have overlooked during construction. Add terraces and berms, or enhance the size of a mountain. Be sure to build up the banks of rivers, ponds, lakes or other water features so that the water product (pages 170-173) you use will be contained by the terrain.


Chapter 3
Landscape

Once the terrain shell is built and the plaster is dry, the next step is to add color and landscaping. This includes coloring the terrain, weathering roads and adding ground cover, trees and water. Each feature will add realism to your layout. They can also be used for camouflaging construction flaws or providing view blocks to make a railroad appear larger.

As with previous chapters, each product will be introduced prior to any information about usage. Tools and adhesives that are used throughout the chapter will be introduced first, and then new products will be introduced as needed.

Some landscaping steps need to be completed in a certain order. For example, the base of a water feature needs to be colored and sealed before the water is poured. Other steps, like whether you apply ballast before or after ground cover, are matters of personal preference. The progression presented in this chapter is only one method of landscaping. Read the entire chapter first and then make adjustments to fit your needs and preferences.



LANDSCAPE TOOLS AND ADHESIVES

Product Overview

Canister Shaker

The Canister Shaker is a clear, plastic 32 fl oz container that is perfect for application and storage of all landscaping products. Use it to apply Fine and Coarse Turf, Ballast and more. The dual cap provides options for pouring and shaking the product, and the name of the product can be written on a blank identification label.

Accent Shakers

Use Accent Shakers to easily apply Plant Hues and Flowers for interest, highlights and shadows. Each shaker is easy to fill, and the cap has multiple opening sizes for different application amounts.

Scenic Sprayer™ and Scenic Cement™

The Scenic Sprayer is a spray bottle made of durable plastic and holds 8 fl oz. The Scenic Sprayer comes with a long siphon tube and a spray head that fits the Scenic Cement bottle. The nozzle is adjustable for a mist or steady stream. Use the Scenic Sprayer with Scenic Cement, Earth Colors Liquid Pigment and other liquids. **NOTE:** Clean the spray head with warm soapy water after each use to prevent clogging.

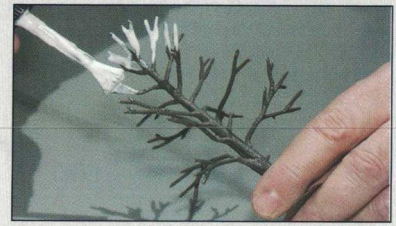
Scenic Cement (16 fl oz) is a ready-to-use spray or brush-on adhesive that is specially formulated to glue Ballast, Turf and other landscape materials to a layout. Scenic Cement contains a wetting agent that breaks surface tension, allowing easier and faster penetration of scenery materials. This creates a strong bond that permeates materials instantly for maximum coverage. Scenic Cement is non-toxic, water-based and dries to a matte finish. Apply Scenic Cement with the Scenic Sprayer for a smooth application that reduces foaming and bubbles.

Scenic Glue™

Scenic Glue is a thick, strong-hold adhesive that isn't brittle and is specially formulated for applying landscaping materials. It is non-toxic, odor-free, water-soluble and dries to a clear matte finish.

Hob-e-Tac®

Hob-e-Tac is a multi-purpose, water-soluble adhesive that dries to a high tack state. It is perfect for attaching foliage to tree armatures or attaching Field Grass and Fine-Leaf Foliage to a layout.

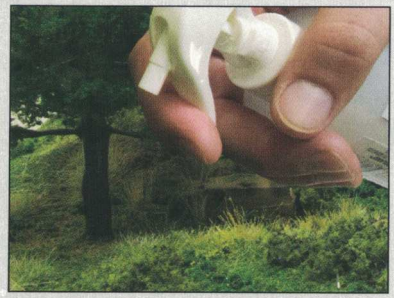


Static-Tac®

Static-Tac is specially formulated and has the right viscosity for adhering Static Grass and Briar Patch. It comes in a bottle with a graduated tip that works for large or small areas. Static-Tac is an easy-to-spread adhesive that dries to a clear matte finish for realistic results.

Spray-Tac™

Spray-Tac is a spray adhesive for adhering Flowers and Plant Hues. It sprays in a fine mist and dries to a clear, matte finish.

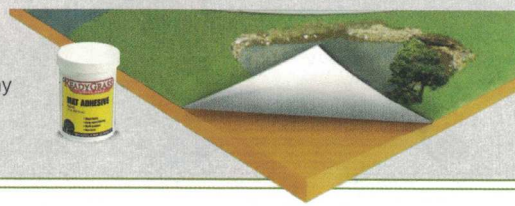


Tuft-Tac®

Tuft-Tac is a thick, high tack adhesive. It holds its shape and is perfect for creating tufts of Static Grass or Field Grass. Tufts can be pre-made before being placed on a layout. **NOTE:** Tuft-Tac glue is not compatible with Realistic Water.

Mat Adhesive

Mat Adhesive is a specially formulated glue that allows repositionable adhesion of ReadyGrass® Vinyl Mats to any surface.



Static King®

The Static King makes it easy to model tall grassy areas and ensures Static Grass is applied vertically. The Static King has an ergonomic design and can be placed upside down for easy filling. It comes with a thatch comb and different Sieve sizes for creating a varied effect using 2-12 mm lengths of Static Grass. A divider allows the use of multiple colors and sizes at the same time for modeling realistic fields and other tall grasses.

- The clear hopper ensures you always know how much Static Grass you have left.
- Built-in bleed-off function allows it to discharge safely on its own.
- Power is supplied via a Power Supply or battery.
- Indicator light makes it easy to know if the Static King is turned on.

Patent Pending

ONLINE VIDEO

Power Supply

The Power Supply connects to the Static King applicator to ensure it consistently operates at full-strength for optimal performance. The Power Supply is available for different regions: U.S., U.K., Europe and Australia/New Zealand.

Model-Vac®

The Model-Vac is the perfect strength for picking up loose landscaping material while leaving glued items behind. This cordless modeling vacuum features an ergonomic design and can access small areas. The Model-Vac is easy to empty and does not cause damage to the excess material so it can be used again.

GRAVEL ROADS ONLINE VIDEO

Gravel roads are the easiest road to make. Often gravel roads are meant for a single vehicle with enough of a shoulder to allow a car to pull off to one side so another car can pass. They can also be wide and spacious depending upon their location and purpose. Consider what traffic would use the road before determining the width.

Product Overview

Gravel

Woodland Scenics Gravel is sized to model realistic gravel roads. It is available in two sizes and two colors. Gravel includes Accent Powder for modeling shoulders and bare spots on gravel roads.

GRAY FINE

GRAY COARSE

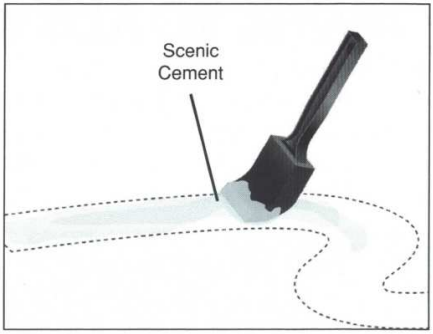
BUFF FINE

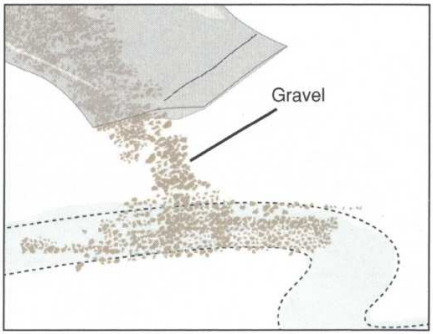
BUFF COARSE

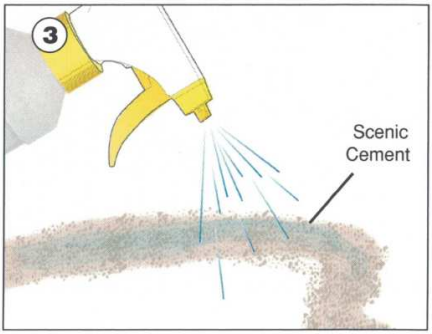
CREATING GRAVEL ROADS

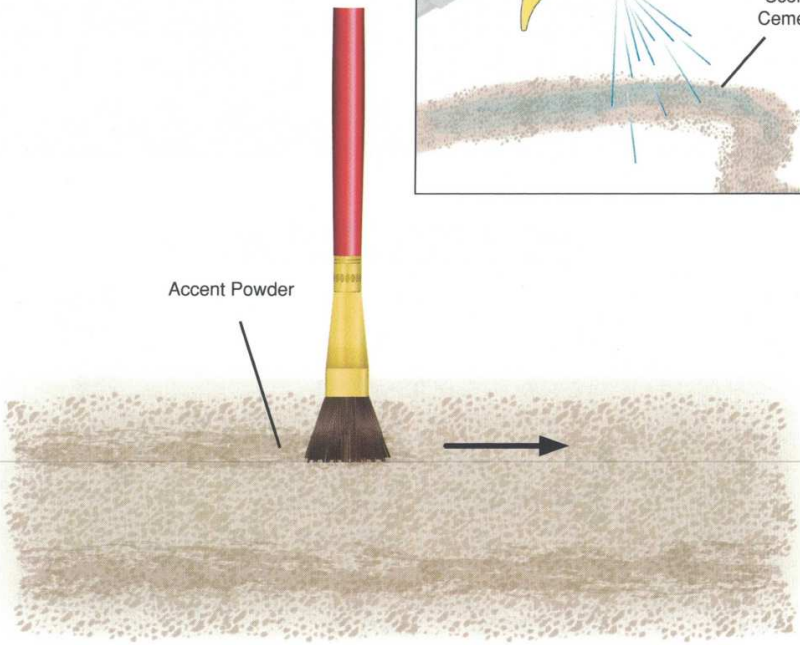
To make a gravel road, use Gravel and Scenic Cement. Brush Scenic Cement on the road area, and then pour Gravel evenly onto the wet adhesive. Use a paintbrush to spread and smooth the Gravel over the road surface. When you are satisfied with the coverage, heavily soak the Gravel with Scenic Cement using the Scenic Sprayer or an eyedropper.

Once the Scenic Cement is dry, you are ready to finish the gravel road with Accent Powder. Dip a paintbrush in the Accent Powder and brush it along the gravel road to simulate tire tracks, fine dirt, potholes and mud pits. Use Scenic Cement to seal Accent Powder in place.









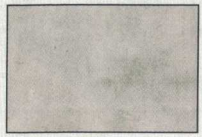
FINISHING PAVED AREAS ONLINE VIDEO

Once Smooth-It has dried completely, it is time to add color and striping. Before you begin, determine what colors you will need and what kind of stripes you will use. Weathering and finishing techniques will be discussed in the next chapter (pages 232-234).

Product Overview

Top Coat™

Top Coat is a non-toxic, water-soluble compound that is available in two colors: Concrete and Asphalt. Top-Coat is brushed on and can be applied directly to Smooth-It.



CONCRETE

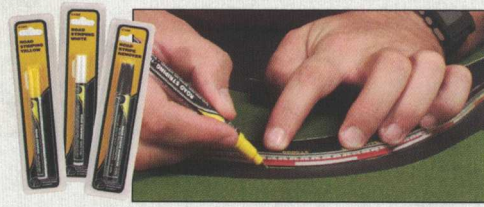
ASPHALT

Flexi Edge™

Flexi Edge makes it easy to paint straight or curvy lines on a road. This flexible ruler is 18" long and will retain a curve on its own. Use Flexi Edge for alignment and the marked guide for correct road-striping markings. Ruler markings include a scaled grid for striping N, HO and O scale roads. There are also scaled measurements for the width of N, HO and O parking spaces, sidewalks, rural roads and highways. The raised inking edge prevents any smears.

Road Striping Pens

Road Striping Pens are available in White and Yellow. They make realistic, precise and opaque markings that dry quickly. The Road Stripe Remover easily removes paint from Top Coat surfaces without leaving any residue behind.



Stripe Decals

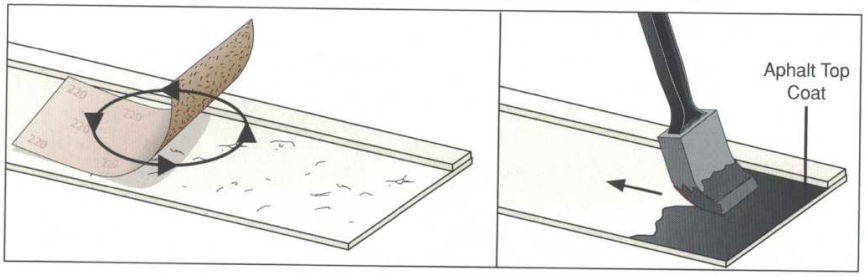
Dry Transfer Decals include road signs, letters, numbers, stripes and more. The decals transfer easily in seconds to any smooth or textured surface, around contours and into grooves. Use Yellow and White Stripes to create stripes on paved areas.

For more information on Dry Transfer Decals, see (pages 234-236).

COLORING PAVED AREAS

To finish your paved area, wait until the Smooth-It is completely dry and sand the surface with 220-grit sandpaper to remove imperfections. Paint paved areas with Top Coat Asphalt or Concrete. Allow it to dry thoroughly before adding stripes (pages 110-111) or weathering (pages 232-234).

For variations in color, mix Concrete and Asphalt Top Coats with Smooth-It when it is wet. Each batch will be a slightly different color, so be sure to mix enough at one time to complete the whole job.



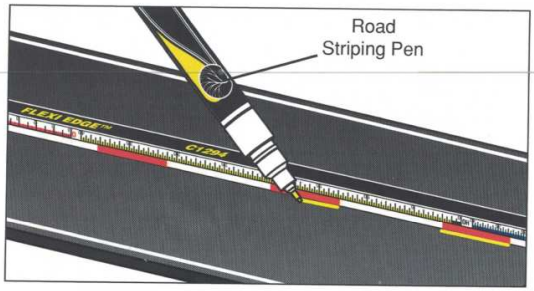
STRIPING ROADS AND PARKING LOTS

Use Road Striping Pens with the Flexi Edge to measure, outline and stripe roads and parking areas. The Flexi Edge is color-coded for each scale. N Scale is blue, HO Scale is yellow and O Scale is red. To stripe roads, use one of the Road Striping Pens to mark along the length of the colored bars that fit your scale. The flexible, self-supporting design makes it easy to make accurate lines along a radius; just bend the Flexi Edge around the curve and keep marking.

NOTE: Keep in mind lines that are true to scale may have spacing that causes the lines to look unrealistic. Use selective compression to model road markings with realistic appearance. For more information, see the Selective Compression section on page 13.

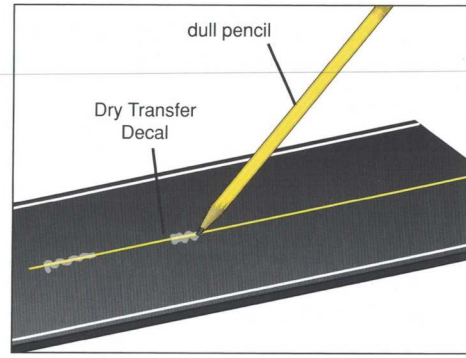
Striping with Pens

Always shake Road Striping Pens well before use. Saturate the tip of the pen with ink by depressing the tip a few times on a scrap piece of cardboard. Remember, you can always use the Road Stripe Remover to remove stripes if you make a mistake. Rub the Road Stripe Remover over the mark, and then dab it dry with a paper towel.



Striping with Decals

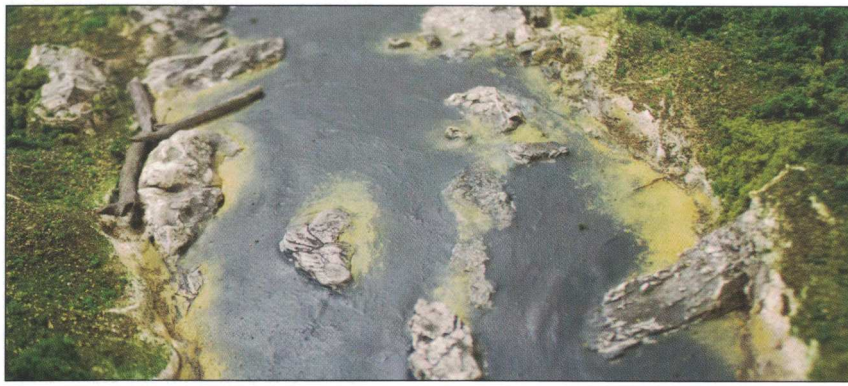
Another way to add stripes and lane markers is with Dry Transfer Decals (page 235) Yellow and White Stripes. Simply cut the decal lines into thin strips along the stripes. Lay the strips on the road surface where desired and hold in place with one hand. Rub the back of the decal with a Burnisher or dull pencil to release the decal onto the road surface. On tight curves, trim the decal very close to the stripe. Secure one end on the road surface and slowly burnish the stripe onto the road surface.



COLORING THE TERRAIN SHELL AND PLASTER CASTINGS

After the plaster and adhesive have dried, it is time to make your bright white plaster terrain shell come alive with color. Take a walk outside and note how colors intermingle in nature. You will notice nature is made up of many shades of colors. Up close, each tree has several shades of green for the leaves. Even the soil has various shades of brown, varying from light brown to almost black. When colors are observed from a distance, such as from an airplane or the top floor of a skyscraper, these colors blend together and give the appearance of a general brown for soil or green for trees.

Observation is your best tool to determine which colors to use. Choose colors based on how they would be viewed from a distance. Then layer the colors so they blend together just as they do in the natural world. Woodland Scenics's products are designed specifically to be layered and blended.



PAINTING TERMS

Several painting terms will be used throughout this chapter.

① **Opaque** —A coat of pigment that is applied straight from the bottle so you cannot see the material beneath it.

② **Dilution** —Add water to the pigment.

③ **Wash** —Pigment that has been diluted with a large amount of water. Washes are meant to be transparent so you can still see the material it is applied to. The more pigment in the wash, the more opaque the wash.

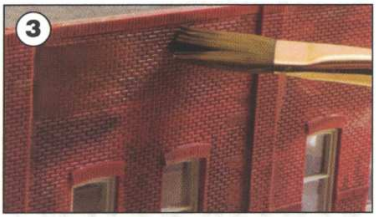
④ **Stain** —Apply a wash that will be absorbed into a surface, like plaster.

⑤ **Blending** —Mix different colors together for a smooth transition from one color to the next or to create new colors.

⑥ **Drybrush** —Dip a stiff, damp paintbrush into paint, pigments or other materials. Blot the paintbrush on a piece of paper towel until the bristles fan out. Then, lightly brush the material over the surface where you want texture. This technique can be used with dry products, like Fine Turf and Plant Hues, for precise application of the material (do not dampen the brush before dipping into the dry material). See page 213 for detailed instructions on using the drybrush technique for weathering.

⑦ **Dab** —Lightly and briefly press a brush or foam brush to a surface to leave a blot of color.

Painting a layer of color over the white plaster terrain shell provides a base of color for plant life to grow from. This will allow you to blend colors and enhance realism.



Earth Colors™ Liquid Pigment

Earth Colors Liquid Pigment is specially formulated for coloring rocks, terrain and plaster castings such as Tunnel Portals and Culverts. These pigments are water-soluble and can be diluted and blended in limitless combinations. Colors include: White, Concrete, Stone Gray, Slate Gray, Black, Raw Umber, Burnt Umber and Yellow Ocher. All eight colors are included in the Earth Colors Kit, which also includes an applicator brush and palette.

ONLINE VIDEO

WHITE

CONCRETE

STONE GRAY

SLATE GRAY

BLACK

RAW UMBER

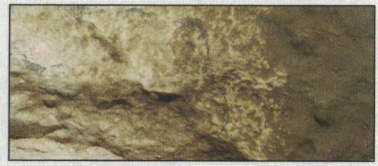
BURNT UMBER

YELLOW OCHER

Earth Colors Liquid Pigment Undercoat

Earth Colors Liquid Pigment Undercoats include Green Undercoat and Earth Undercoat. These colors provide a base color for terrain and can be diluted just like other Earth Colors Liquid Pigment.

GREEN UNDERCOAT



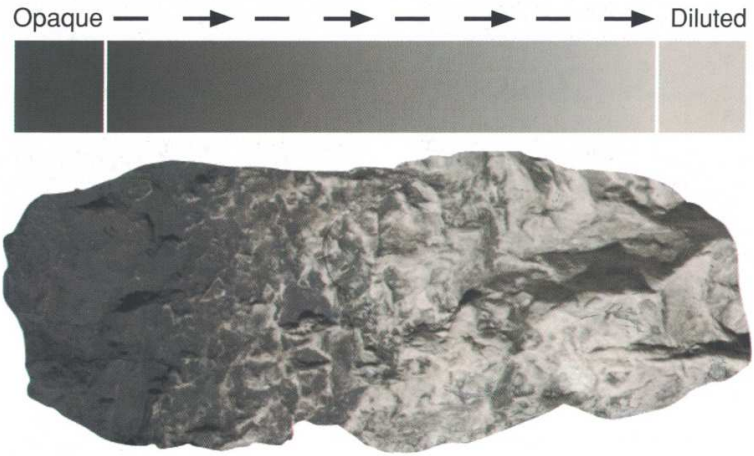
EARTH UNDERCOAT

DILUTION

When Earth Colors Liquid Pigment and Undercoats are diluted with water, the colors flow and pool easily into the crevices of the terrain shell in a way that creates natural color variation. Dilution is an easy way to blend pigment colors directly on the terrain shell. Applying Earth Colors Liquid Pigment and Undercoats straight from the bottle in an opaque coating creates hard lines on the terrain shell because plaster is very absorbent. The pigment absorbs into the plaster very quickly, allowing little time to blend the full strength pigment and leaving an opaque color on the plaster.

Both dilution and opaque applications are useful to a modeler for different outcomes. Dilute when you want to blend colors. Apply the pigment full strength when you want to apply rich, opaque colors in a controlled manner.

Dilute Earth Colors Liquid Pigment with water in a cup, mixing tray (for small amounts) or the Scenic Sprayer. The Scenic Sprayer is convenient because it has ounce markings noted on it for measuring exact amounts. Exact measurements are helpful when diluting the pigment to create custom color washes with a specific ratio of water to pigment. Use the Scenic Sprayer to spray pigment on plaster castings and terrain for a quick and easy application. If the pigment is diluted in a cup or mixing tray, simply use a foam brush to apply the pigment.



PLASTER ABSORBENCY AND PIGMENTS

Plaster surfaces vary from highly porous to non-porous. A porous plaster surface provides the best absorption of a color wash. Non-porous plaster surfaces may not absorb color washes at all. Marring, rubbing, smoothing or polishing can close pores on the surface of a plaster casting, making it less porous and less absorbent. Applying adhesive to

plaster will also reduce the plaster's porosity and absorbency. The more porous the surface of the plaster, the more readily it will absorb color washes.

Dry plaster absorbs moisture and color washes more readily than wet plaster. If a plaster casting or terrain is saturated with water, it will not accept color washes at all. Partially dry plaster will not accept pigment evenly across the surface of the casting. The pigment on the areas that are drier will appear more intense and darker, while the damp areas will be lighter. Older plaster castings will absorb more pigment and appear darker than a casting made recently. Allow castings to dry thoroughly before coloring them.

The type of plaster also affects the outcome. Mold-A-Scene Plaster, for example, has a light sandy texture and color. It accepts color washes differently than the smooth, bright white Lightweight Hydrocal. Use the same kind of plaster if you intend to match colors in specific areas of your layout.

For best results, apply color washes on plaster surfaces that are porous and dry enough to absorb the pigment. Try experimenting on excess materials before staining permanently installed plaster terrain or castings with Earth Colors Liquid Pigment.

If you apply a color wash on a plaster surface and the color is not accepted, use an opaque coating of pigment. Allow the area to dry thoroughly before dabbing the undiluted pigment on the area. Then blend the opaque pigment with the surrounding area.

LEOPARD SPOT TECHNIQUE ONLINE VIDEO

The Leopard Spot painting technique is an easy way to create variation in colors for a realistic appearance. This technique uses various color washes that are dabbed on randomly, then tied together with an over-coat of dominant color wash.

Use a foam brush, bristle brush or the Scenic Sprayer to apply Liquid Pigment. When using a brush, let it soak up the pigment. Then apply the pigment by dabbing the brush on the surface. This technique is not meant to be precise. You want the colors to run together, mix and seep into the rock crevices. Be sure to rinse your brushes out before moving from one color to the next, or use different brushes for different colors. You want the colors to mix on the plaster, not in the cup.

For beginners, we recommend using three colors—two secondary colors and one dominant color. As you get more familiar with how the colors work together, begin experimenting with additional colors. You will always need a dominant color wash, but you can add as many secondary colors as you like. Remember that you can mix Liquid Pigments prior to application to make a custom color.

Pick two lighter secondary colors and one dark color for the dominant wash. You will dilute all three colors in different amounts, as noted below. If color washes are too light on castings, add a little more pigment to the washes for a darker color.

Color Wash Dilutions

Secondary Color Washes: 1-part Liquid Pigment to 16-parts water

Color Suggestions: Black, Burnt Umber, Concrete, Stone Gray, White, Yellow Ocher

Dominant Color Wash: 1-part Liquid Pigment to 32-parts water

Color Suggestions: Raw Umber, Slate Gray, Black

Apply the lightest secondary color wash randomly over 1/3 of the rock casting. Then apply the next secondary color wash randomly over a different 1/3 of the rock casting. Allow the washes to run together naturally. After the second color, 1/3 of the rock should still be white.

Apply the dominant color wash over the entire rock casting to tie colors together. Let it flow into all cracks and crevices, and mix with the secondary washes. Be sure to cover the secondary colors as well as the white areas with the dominant wash. Let it dry completely.

Once it has dried, seal the colors with a mist of Scenic Cement. Once the Scenic Cement is dry, apply a more concentrated black wash (a ratio of 1:16) over entire rock to emphasize cracks and crevices. Once the black wash is dry, spray again with Scenic Cement to seal the colors.

When using three secondary colors, apply each color over a different 1/4 of the rock face, leaving 1/4 of the casting white. Continue with this pattern, depending on the number of color washes. Be sure to always leave some of the casting white before applying the dominant wash.

1/3 of the rock - Yellow Ocher (1 part pigment, 16 parts water)

1/3 of the rock - Burnt Umber (1 part pigment, 16 parts water)

3/3 of the rock - Black (1 part pigment, 32 parts water)

Let dry.

REMOVING LIQUID PIGMENT & RECOLORING ROCKS

If you decide you do not like how the coloring turned out, you can remove the majority of the Liquid Pigment and start over. To remove the pigment, saturate the castings by spraying them with hot salt water (1 tsp salt in 6 oz water). Blot the casting with a paper towel. If needed, wait one minute and spray again. The salt water should remove the majority of the pigment. Once dry, the rock is ready to be colored again.

If pigment remains, let the casting dry then cover the rock with an opaque coating of White Liquid Pigment. This will help cover up any lingering color. Once the White Liquid Pigment is dry, you are ready to re-apply color as described in the Leopard Spot Technique section.

Please note coloring cannot be removed from surfaces that have been sealed with Scenic Cement, Flex Paste, Scenic Glue, super glue or other adhesives/sealants. Sealed surfaces must be recolored with opaque pigments.

COLORING THE TERRAIN SHELL ONLINE VIDEO

After the rocks on your layout have been colored, it is time to color the terrain shell. This will create a base for the plant life on your layout. Earth Colors Undercoats are designed specifically to color the terrain shell, but you can use any of the Liquid Pigments. We recommend using either undiluted pigment or a dilution of 1 part pigment to 2 parts water to color the terrain shell. You can add more Undercoat or Liquid Pigment as needed to create the desired effect.

Remember that the color you put on your terrain shell is meant to blend with the plant life you intend to put on top of it. If you want a muddy area, use a brown color in those areas. If you know there is going to be a bright green field full of plant life, use green. Blend the pigment colors together for extra realism.

NOTE: Do not color water areas yet. Coloring water areas will be discussed later in the chapter (page 175).

BALLAST

On a real-world railroad, ballast is rock that is broken and spread under railroads and between railroad ties to provide stability and water drainage.

Product Overview

Ballast

Woodland Scenics Ballast is available in a variety of colors and sizes. Be sure to consider scale when selecting a size of Ballast. Large rocks would not fit well between ties, and rocks that are too small would wash away. Ballast can also be used to create embankments and realistic shoulders for highways and roads. Use it around mining operations, in rail yards and wherever crushed rock would appear. Ballast can be used as a load in a hopper car.

BALLAST SCALE REFERENCE CHART

SCALE	FINE Particle size: 0.0103"-0.033" (0.26 mm-0.83 mm)	MEDIUM Particle size: 0.033"-0.049" (0.83 mm-1.24 mm)	COARSE Particle size: 0.05"-0.082" (1.27 mm-2.08 mm)
Z	2.2"-7.3" (5.58 cm - 18.5 cm)	7.3"-11" (18.5 cm - 27.9 cm)	11"-18.3" (27.9 cm - 46.4 cm)
N	1.6"- 5.3" (4.06 cm - 13.4 cm)	5.3"- 8" (13.4 cm - 20.3 cm)	8"-13.3" (20.3 cm - 33.7 cm)
HO	0.9"- 2.9" (2.28 cm - 7.36 cm)	2.9"-4.3" (7.36 cm - 10.9 cm)	4.3"- 7.2" (10.9 cm - 18.2 cm)
S	0.6"- 2.1" (1.52 cm - 5.33 cm)	2.1"-3.2" (5.33 cm - 8.12 cm)	3.2"- 5.3" (8.12 cm - 13.4 cm)
O	0.5"-1.6" (1.27 cm - 4.06 cm)	1.6"-2.4" (4.06 cm - 6.09 cm)	2.4"- 3.9" (6.09 cm - 9.9 cm)
G	0.24"-0.8" (6.09 mm - 2.03 cm)	0.8"-1.2" (2.03 cm - 3.04 cm)	1.2"-1.9" (3.04 cm - 4.82 cm)

IRON ORE

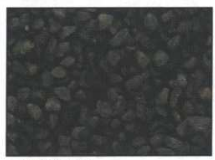
DARK BROWN

BROWN

BUFF

LIGHT GRAY

GRAY



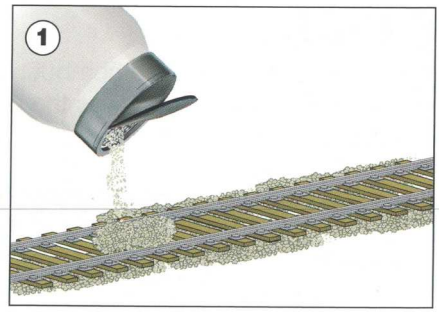
CINDERS

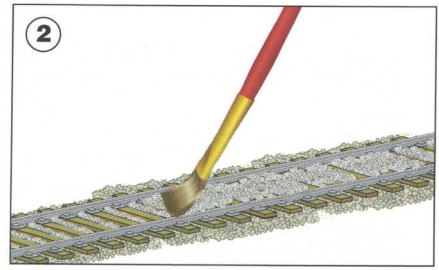
GRAY BLEND

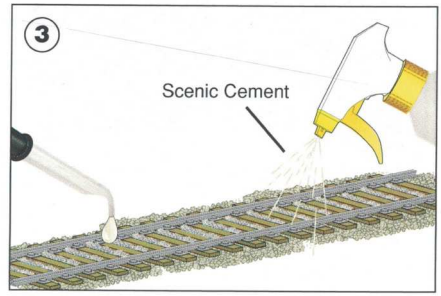
APPLYING BALLAST

ONLINE VIDEO

To apply Ballast to track, pour a small quantity of Ballast down the middle of the track. Use a dry paintbrush to smooth out the Ballast and sweep off ties and rail. Rails and the tops of the ties should be free of Ballast. Soak the Ballast with Scenic Cement using the Scenic Sprayer or an eyedropper. Be sure to saturate all of the Ballast and let it dry. If using the Scenic Sprayer, hold the nozzle close to the Ballast and very slowly pull the trigger. The Scenic Cement will come out in a slow, low-pressure drip which makes it easier to control.







Ballast will roll off any surface that is not level. To apply Ballast to the beveled edge of Track-Bed or on a steep road embankment, apply a thin coat of Scenic Glue or Foam Tack Glue to the angled edge. Then use a Canister Shaker to shake Ballast over the glue. Allow the glue to dry at least partially before applying Scenic Cement. Saturate with Scenic Cement as described above. For the best results, apply Ballast to the edges of the Track-Bed before you apply it to the track and railroad ties.

TIP! If you are installing Ballast in a hopper, cut a piece of Foam Sheet to size and insert it in the car first. This will take up some of the space so less Ballast is required to create the appearance of a full hopper. The foam also reduces the weight the locomotive must pull.

After Ballast has been applied and the Scenic Cement has dried thoroughly, you need to clean the track to remove dust and adhesive residue. If the track is not carefully cleaned, power may not get to the engines or derailments could occur. The Rail Tracker™ Cleaning Kit (page 241) provides everything you need to ensure the track is clean. An alternative is to clean the track with an eraser-type track cleaner.

COAL

In the real world, coal is a combustible rock that is mined and used as fuel. For many years, it was the primary source of heating and electricity in the United States.

Product Overview

Coal

Woodland Scenics Coal is a natural, realistic product that can be used in any scale. It comes in two sizes – Mine Run (smaller) and Lump (larger).

COAL SCALE REFERENCE CHART

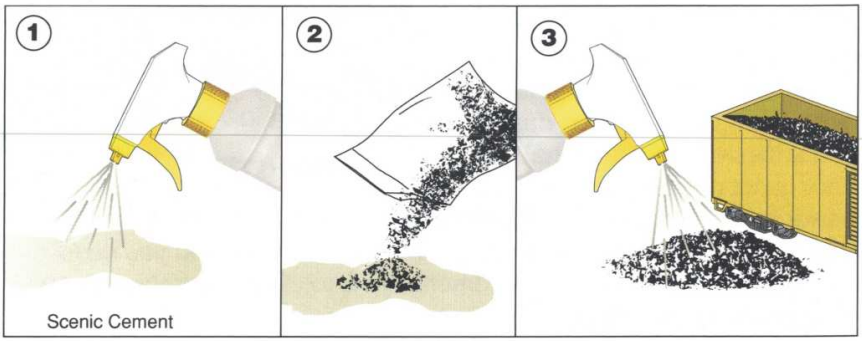
Scale	Mine Run	Lump
N	0"-12" (0 - 30.4 cm)	8"- 20" (20.3 - 50.8 cm)
HO	0"- 6" (0 cm - 15.2 cm)	4"-10" (10.1 cm - 25.4 cm)
O	0"- 3" (0 cm - 7.62 cm)	2"- 5" (5.08 cm - 12.7 cm)

MINE RUN

LUMP

Use mounds of Coal around coal mines or facilities to add realistic detail or as a load in a hopper. Scatter Coal where workers would be moving it from one area to another. To install, spray the area you want to install Coal with Scenic Cement. Pour the Coal on the area then mist it with Scenic Cement to seal in place.

TIP! If you are installing Coal in a hopper, follow the same method suggested for Ballast (page 119).



TALUS (ROCK DEBRIS)

Due to cycles of freezing and thawing, erosion and human impact on the environment, rock is constantly breaking down into chunks known as talus or rock debris. Talus is seen near the base of mountains and rock cuts, around retaining walls and tunnel portals, along the bottom of culverts, in and beside rivers and almost any low-lying area. Talus varies in size from small crushed rock to very large boulders.

Product Overview

Talus

Woodland Scenics Talus comes in a number of sizes and colors to blend with the coloring of the mountains.

TALUS GRADES

FINE	MEDIUM	COARSE	EXTRA COARSE
BUFF	BROWN	GRAY	NATURAL

COLORING TALUS

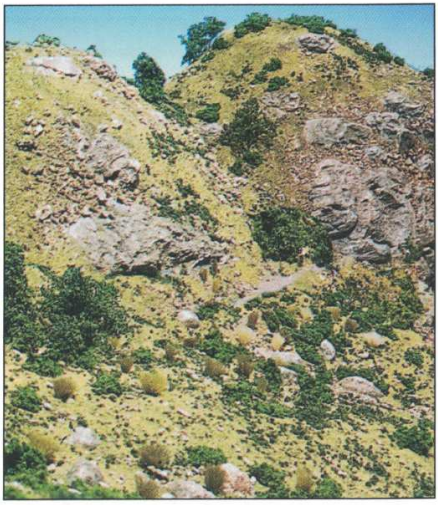
Talus will look the most realistic when the color matches the rock castings on your layout. If a specific color is required, Talus can be colored with Earth Colors Liquid Pigment. This process will be easiest using the "Natural" color. It is best to color Talus before installing it on your layout.

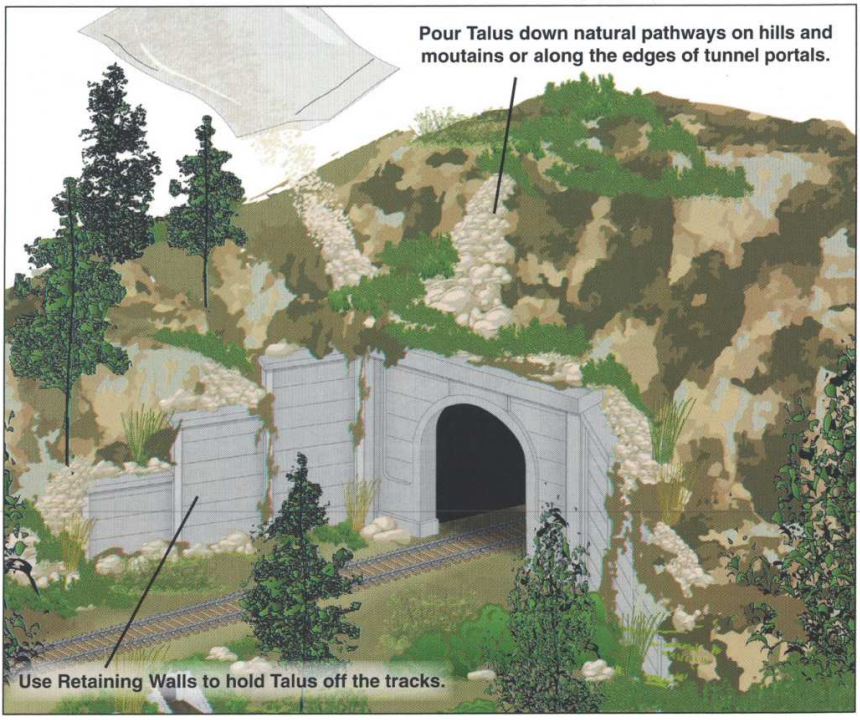
Use the same Liquid Pigments that were used for coloring the rock castings on your layout. Either use the leftover diluted Liquid Pigment from coloring rocks or use the Liquid Pigment at full strength. Add Talus to a cup and stir to evenly coat it with Liquid Pigment. Spread Talus on paper towels or newspaper to dry. If you find that you need to color Talus after it has been installed on the layout, simply stream, dribble or dab Liquid Pigment on the Talus.

APPLYING TALUS

To attach Fine and Medium Talus to the layout, sprinkle Talus where desired. Then saturate with Scenic Cement using an eyedropper or the Scenic Sprayer. To attach Coarse and Extra Coarse Talus, apply Scenic Glue where desired and press Talus into the glue. If you need Talus to lay flat or want to create a partially submerged look, use sandpaper to sand the bottom of large Talus.

For optimal results, use a combination of Talus sizes. Apply larger sizes first, and then apply smaller sizes. Use Extra Coarse Talus as boulders and place them individually. Then spread the smaller Talus. Start at the tops of hills and let the Talus make its own natural path down the mountain. You can also place Talus around tunnel portals and retaining walls, at the bottoms of cliffs and along rivers. To finish, sprinkle Fine Talus on top of the Talus areas. Secure Talus with Scenic Glue or Scenic Cement.





VEGETATION

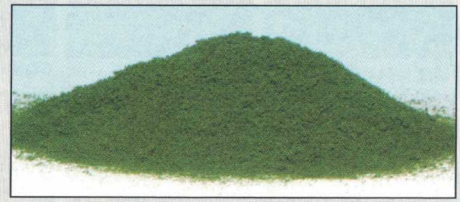
Once the rock and terrain colors have dried, your layout is ready for plant life, such as grass, bushes, shrubs, vines and more. Unless space is reserved for buildings, all open areas where the plaster or terrain base is visible can be covered with some kind of vegetation or soil. You can add vegetation to rocks, Tunnel Portals and other features to model moss and vines. Vegetation can also be used to cover up design and construction flaws on your layout.

All of the following options for vegetation can be used for any scale and blend naturally. They are also colorfast, which means the color will not fade over time.

Product Overview

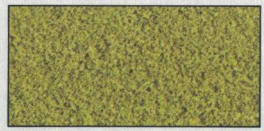
Fine Turf

Fine Turf is available in six colors for modeling fresh, scorched and dying grasses, moss, weeds and dirt roads. Fine Turf is also used to add texture and highlights to trees, grasses, foliage and other ground cover.



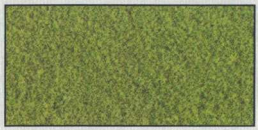
Particle size approx. 1/1000" - 1/32" *(0.025 mm - 0.79 mm)*

SOIL



EARTH

YELLOW GRASS



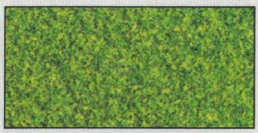
BURNT GRASS

GREEN GRASS

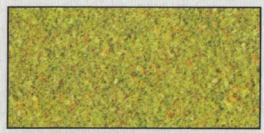
WEEDS

Blended Turf

Blended Turf is available in two colors for creating a base covering over Earth Colors Liquid Pigment. It is also used for modeling grass and weeds.



GREEN BLEND



EARTH BLEND

Coarse Turf

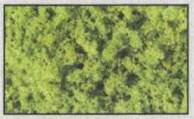
Coarse Turf is available in 11 colors for modeling any season. Use it to model low grasses, leaves and weeds. Coarse Turf creates a smooth transition between different heights of ground cover and adds texture and highlights to trees and scenery.

Particle size approx. 1/32" - 1/8" *(0.79 mm - 3.17 mm)*

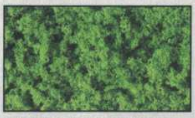
EARTH

YELLOW GRASS

BURNT GRASS



LIGHT GREEN

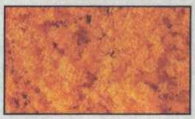


MEDIUM GREEN

DARK GREEN

CONIFER

FALL YELLOW



FALL ORANGE

FALL RED

FALL RUST

Static Grass Flock™

Static Grass Flock is available in six colors and stands upright when applied with the Static King. It is a fiber product that is used for modeling grass and weeds. Use it under trees, along ditches or as forest litter.

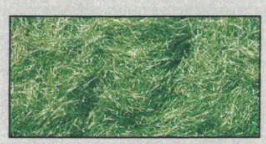
Fiber size approx. 1/16" - 1/8" *(1.58 mm - 3.17 mm)*

WILD HONEY

HARVEST GOLD

BURNT GRASS

LIGHT GREEN



MEDIUM GREEN

DARK GREEN

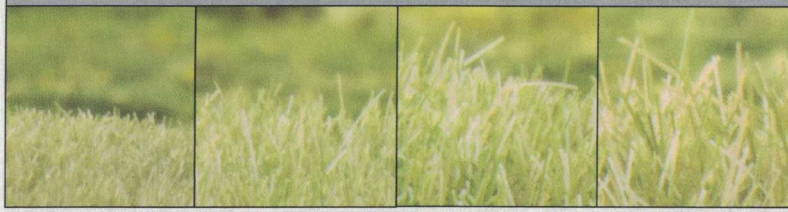
Static Grass

Static Grass is a material that stands upright when applied with the Static King. Use Static Grass to model fields and other tall grasses.

Static Grass is available in four lengths and four pre-blended colors. Blend multiple lengths and colors to replicate all phases of growth.

Scale	2mm Static Grass	4mm Static Grass	7mm Static Grass	12mm Static Grass
N (1:160)	1' (30 cm)	2' (61 cm)	4' (122 cm)	6.5' (198 cm)
HO (1:87)	7" (18 cm)	1' (30 cm)	2' (61 cm)	3.5' (107 cm)
O (1:48)	4" (11 cm)	8" (20 cm)	1' (30 cm)	2' (61 cm)

STATIC GRASS HEIGHTS



DARK GREEN | MEDIUM GREEN | LIGHT GREEN | STRAW

Underbrush

Underbrush is available in six colors. Use Underbrush to model smaller bushes and shrubs.

Particle size approx. 1/8" - 5/16" *(3.17 mm - 7.93 mm)*

OLIVE GREEN | LIGHT GREEN | MEDIUM GREEN

DARK GREEN | FOREST GREEN | FOREST BLEND

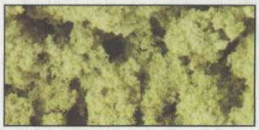
Poly Fiber

Poly Fiber is a synthetic fiber used to model shrubs, vines, undergrowth and other rambling vegetation. Apply Poly Fiber to the sides of buildings, Tunnel Portals, Street Lights, Billboards, along Fences or other places you see vines grow.

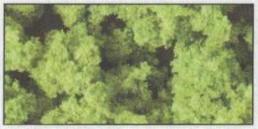
Bushes

Bushes are available in six colors. Use Bushes to model larger bushes, hedges and shrubs.

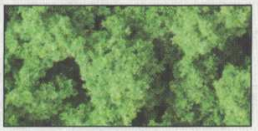
Particle size approx. 5/16" - 1/2" *(7.93 mm - 12.7 mm)*



OLIVE GREEN



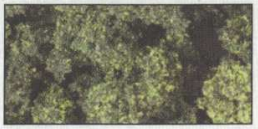
LIGHT GREEN



MEDIUM GREEN

DARK GREEN

FOREST GREEN



FOREST BLEND

Flowering Foliage™

Flowering Foliage is available in two colors. It is a fast and easy way to model wildflowers and flowering fields, vines, bushes and shrubs.

YELLOW

PURPLE

Field Grass

Field Grass is a fine, natural product that models tall grasses, tufts of grass and weeds. It is colorfast and available in four natural colors.

NATURAL STRAW

HARVEST GOLD

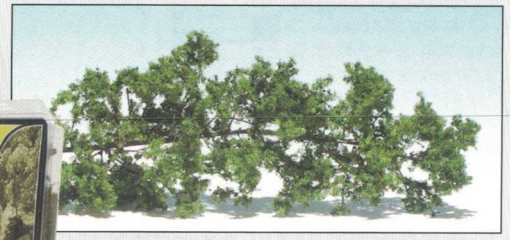
LIGHT GREEN

MEDIUM GREEN

Fine-Leaf Foliage™

Fine-Leaf Foliage is a natural product that is available in six colors. Its fine leaf detail adds a new dimension to any layout and is great for modeling bushes, saplings, shrubs and hedges or making exquisite trees. A Tree Armature sample is included in each package.

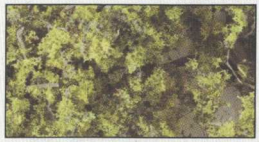
Patented



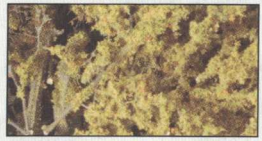
DARK GREEN

MEDIUM GREEN

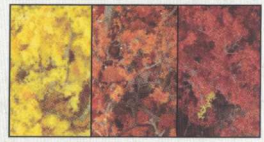
LIGHT GREEN



OLIVE GREEN



DEAD FOLIAGE



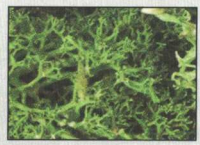
FALL MIX

Lichen

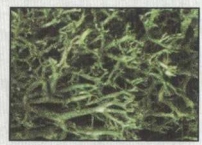
Lichen is a natural material with a unique texture used to model vines, shrubs, hedges, small bushes, underwater vegetation and other undergrowth. It is available in six colors for modeling any season.

SPRING GREEN

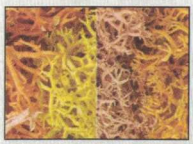
LIGHT GREEN



MEDIUM GREEN

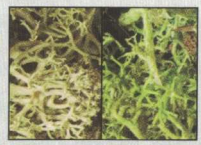


DARK GREEN



AUTUMN MIX

NATURAL



LIGHT GREEN MIX

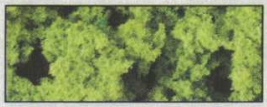
DARK GREEN MIX

Clump-Foliage™

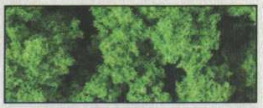
Clump-Foliage is available in six colors. Mix and match with other foliage to create variation in trees, shrubs and bushes and to landscape hillsides. Clump-Foliage is colorfast and works for all scales.

Particle size approx. 1/8" - 1 1/2" *(3.17 mm - 3.81 cm)*

BURNT GRASS



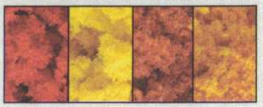
LIGHT GREEN



MEDIUM GREEN

DARK GREEN

CONIFER GREEN



FALL MIX

Foliage

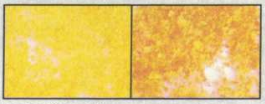
Foliage is available in six colors. It is excellent for making trees, vines, weeds, bushes, hedges or any low growth.

LIGHT GREEN

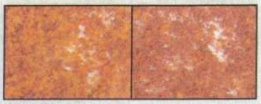
MEDIUM GREEN

DARK GREEN

CONIFER GREEN



EARLY FALL

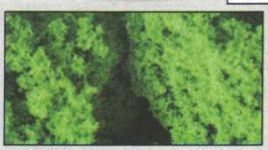


LATE FALL

Foliage Clusters™

Foliage Clusters are available in three colors. Break Foliage Clusters into any size cluster and use it to model bushes, hedges, and shrubs. Foliage Clusters can also be used on hillsides to model tree masses.

LIGHT GREEN



MEDIUM GREEN

DARK GREEN

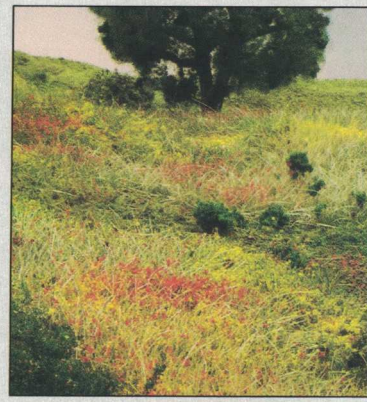
LANDSCAPE ACCENTS

Landscape accents are usually added after trees, bushes and other ground cover. These accents are used to add finishing details or a little extra color and realism to your layout.

Product Overview

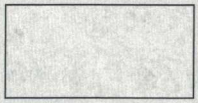
Flowers

Flowers model yellow, white, orange and red flowers. Use Flowers to create realistic flowerbeds, flowering trees, bushes and vines.



RED

YELLOW



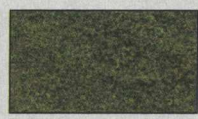
WHITE

ORANGE

Pollen

Pollen is designed for creating realistic artificial flowers but can be used just like Flowers on a diorama.

CHARCOAL



BROWN

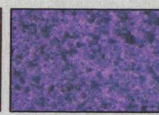
GOLD

GREEN

YELLOW

ORANGE

RED



PURPLE

PINK

Fruit

Fruit includes two colors: red and orange. Sprinkle Fruit on tree foliage and ground cover to model fruit and fallen fruit.

RED

ORANGE

Briar Patch

Briar Patch is a natural material that makes it simple to model brambles, thickets and shrubbery. It is available in two colors and ready to use straight out of the package.

Patented

DRY BROWN

MEDIUM GREEN

Plant Hues

Plant Hues model the appearance of seed heads and create a subtle, variegated appearance for realistic fields and meadows. Use Plant Hues to emphasize contours with highlights and shadows. Plant Hues include four colors: Golden, Wheat, Shadow Green, and Red Switch.

GOLDEN

WHEAT

SHADOW GREEN

RED SWITCH

Stumps

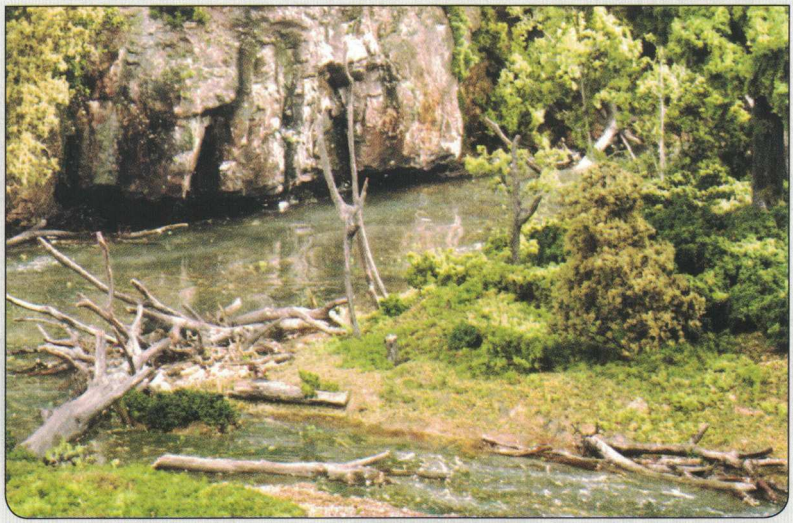
Cut Stumps and Broken Stumps are lead-free metal castings that are easy to paint and attach to a layout. Use these stumps along rivers, on the edge of a field or to model deforested areas from logging operations.

CUT STUMP

BROKEN STUMP

Dead Fall

Dead Fall is a natural, realistic product for modeling dying and decaying wood. It has the look of aged wood with gnarled branches, knots and some smooth, weathered pieces. Use Dead Fall in water areas to replicate flooded timbers or logjams on a river, on hillsides or in swamps to model fallen timber and debris. Dead Fall can also be submerged in water features (pages 180-181).



ATTACHING VEGETATION ONLINE VIDEO

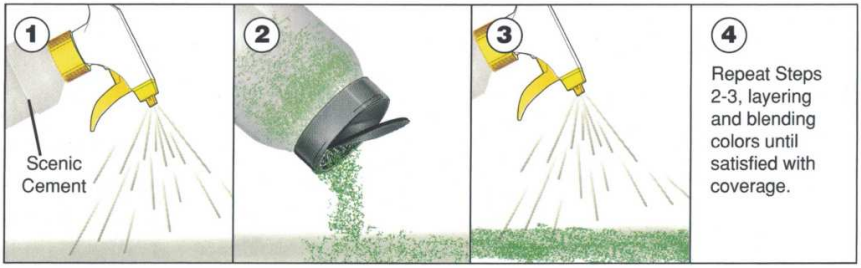
The way you attach vegetation on your layout will vary depending on the type of vegetation you are using, as well as the effect you wish to achieve. This section is divided by adhesive and technique. Different products and techniques require different adhesives, so be sure to consult your product instructions to see which adhesives are recommended.

Attaching with Scenic Cement

Scenic Cement is ideal for attaching Fine Turf, Blended Turf, Coarse Turf, Static Grass Flock, Flowers, Plant Hues and Fruit. There are a few different ways you can use Scenic Cement to attach these products.

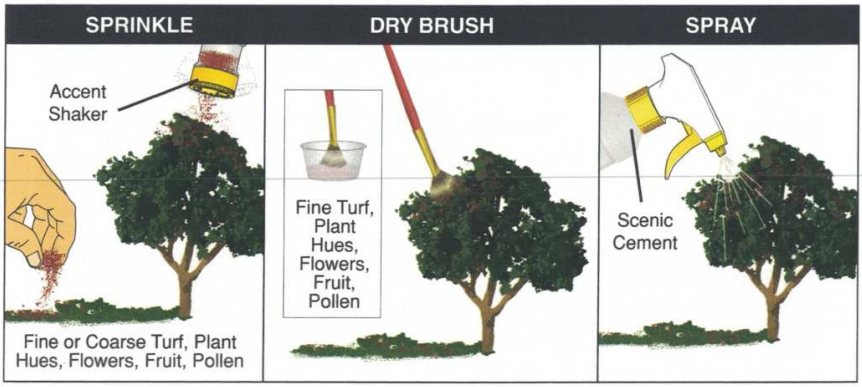
Attaching Ground Cover

To model ground cover, evenly spray the area you want to landscape with Scenic Cement. Then sprinkle Fine Turf, Blended Turf or Coarse Turf over Scenic Cement. Finish with another even mist of Scenic Cement. Add additional layers and colors by repeating this method. If the previous layer is still wet from the top spray, you do not need to spray it again. Just sprinkle the next layer of Turf over it and mist again with Scenic Cement. You can also use this method to attach Static Grass Flock when using it as a landscape accent.



Highlights and Accents

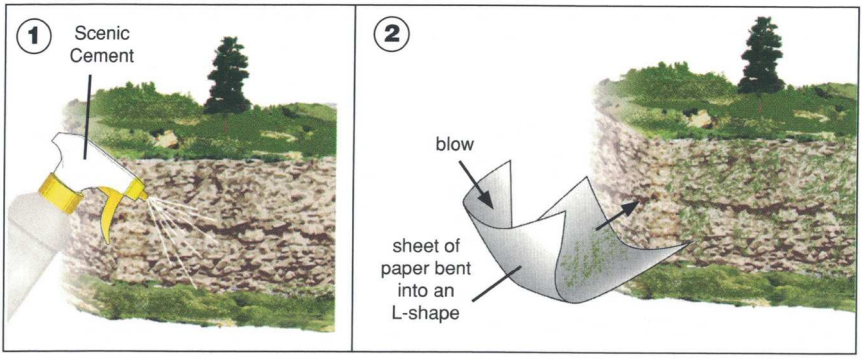
To accent an area with highlights, low lights or subtle color variation, simply sprinkle or drybrush Fine Turf, Blended Turf, Coarse Turf, Plant Hues, Flowers, Pollen or Fruit over the desired area. Then spray the area with Scenic Cement. To drybrush, dip a dry paintbrush in the Turf or Fruit and brush it on the area. The dry brush method is particularly useful when adding color variation to vegetation such as Underbrush, Bushes, Clump-Foliage, Fine-Leaf Foliage, Poly Fiber and Lichen.



Flyspecking

Flyspecking is a method of applying Fine Turf or Blended Turf that recreates the effect of having vegetation or soil on vertical terrain and rock faces. You could also use this for moss on the side of a building. This method creates exceptional realism in these areas by adding detail and texture, suggesting holes and porosity in the rocks or terrain.

To flyspeck, start by lightly misting the area with Scenic Cement. Then bend a sheet of paper into an L-shape. Place the Turf on the horizontal section of the paper. Position the horizontal section of the paper close to the vertical area and gently blow air down the vertical section of the paper. Turf will fly off of the paper and stick to the vertical terrain feature. Mist the area again with Scenic Cement, if needed. For the most realism, use minimal amounts of vegetation.



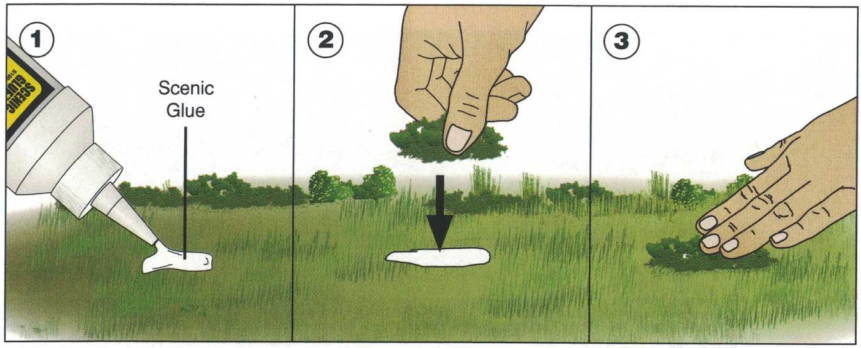
Attaching with Scenic Glue

Larger vegetation should be secured with Scenic Glue. This includes Underbrush, Bushes, Clump-Foliage, Foliage Clusters, Fine-Leaf Foliage, Poly Fiber, Flowering Foliage, Lichen, Field Grass, Briar Patch, Cut Stumps, Broken Stumps and Dead Fall.

There are two general ways to use Scenic Glue.

Option 1

Apply Scenic Glue directly to your layout in the area you want to apply vegetation, and then place the vegetation in the Scenic Glue. Push the product into the glue for a good bond.



Option 2

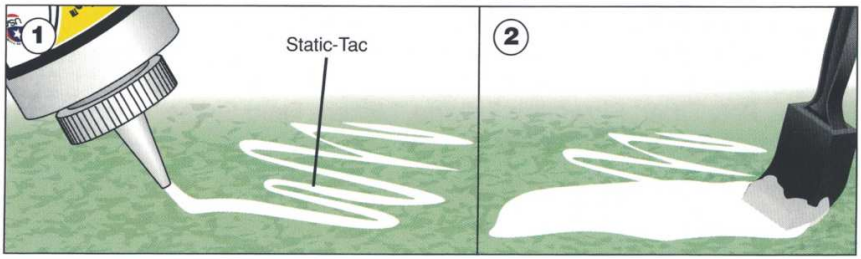
Place a little Scenic Glue in a disposable cup or on a non-porous surface. Dip the vegetation in the glue and place it on the layout. You may need to hold the product in place until the glue begins to set.

Attaching with Static-Tac

Static-Tac is primarily used to attach Static Grass. It can also be used to secure Briar Patch and similar products in grassy areas. Static-Tac can be applied directly to the terrain shell or over preinstalled landscaping products including Fine Turf, Blended Turf, Coarse Turf, Ballast and Talus.

Apply Static-Tac to the Terrain Shell

Gently squeeze Static-Tac onto the terrain shell. Then use a foam brush or bristle paintbrush to spread it anywhere Static Grass or Briar Patch is desired. Static-Tac will dry quickly. For longer application time and the best adhesion, do not brush Static-Tac out so thin that it becomes completely transparent. You want it to be a milky white color on the terrain shell before applying Static Grass or Briar Patch.



Attach Briar Patch

Press pieces of Briar Patch into the Static-Tac. Allow Static-Tac to dry before moving the diorama.

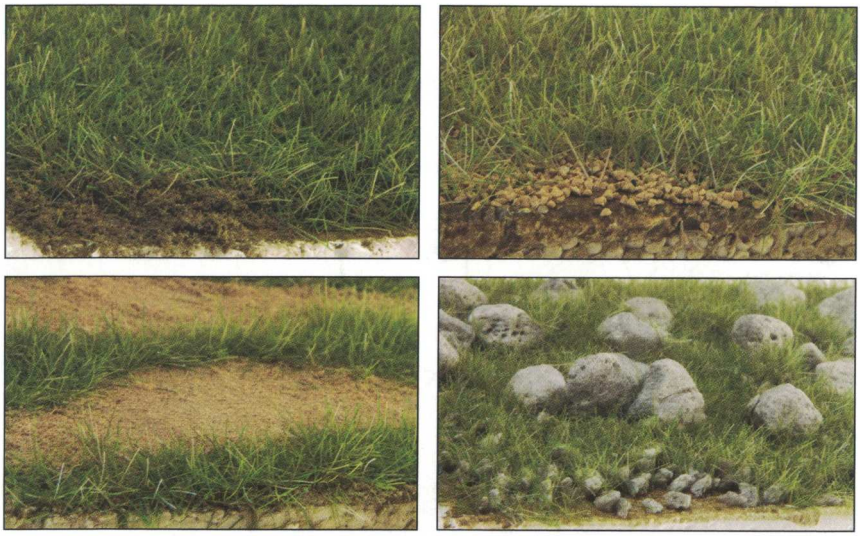
Attach Static Grass to the Terrain Shell

Use the Static King (following all instructions) to apply Static Grass or Static Grass Flock over Static-Tac. The electrical field the Static King produces will shoot Static Grass into the Static-Tac so that the Static Grass stands upright. Use the Model-Vac to remove excess Static Grass from the application area, or simply turn the diorama over.

To thicken the application, shake more Static Grass over the first application while the adhesive is still wet. You can also apply different colors or heights of Static Grass while the adhesive is wet. For dense undergrowth, apply shorter (and darker) colored Static Grass over taller Static Grass that is already installed.

Attach Static Grass to PreInstalled Landscaping Materials

Static Grass is designed to attach directly to Fine Turf, Coarse Turf, Ballast and Talus that have already been installed on the layout. This allows modelers to accent existing layouts with Static Grass and is an excellent way to blend colors and textures. To install, soak the preinstalled landscaping material with Static-Tac. Wait a few seconds; the Static-Tac will spread through the dry material on its own. Once the area is wet, apply Static Grass with the Static King. Do not turn your diorama over or some landscaping material might detach from the terrain shell. Use the Model-Vac to remove the excess, or wait until the Static-Tac is completely dry to remove the excess.

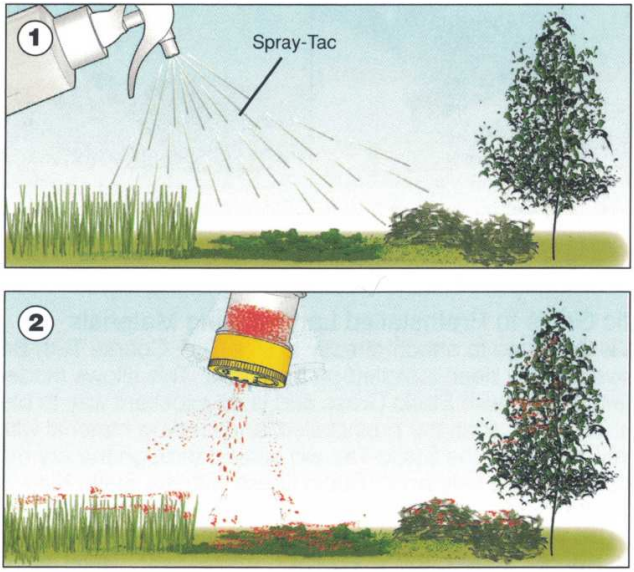


Attaching with Spray-Tac

Spray-Tac is applied in a fine mist that is ideal for attaching items that are very fine, such as Plant Hues and Flowers. It also has enough body to be used to thicken or increase the height of a pre-installed application of Static Grass after the base adhesive has dried. Spray-Tac can also be used to apply Static Grass over preinstalled landscaping materials, such as Fine Turf, Blended Turf, Coarse Turf, Ballast or Talus. Simply saturate the material and apply.

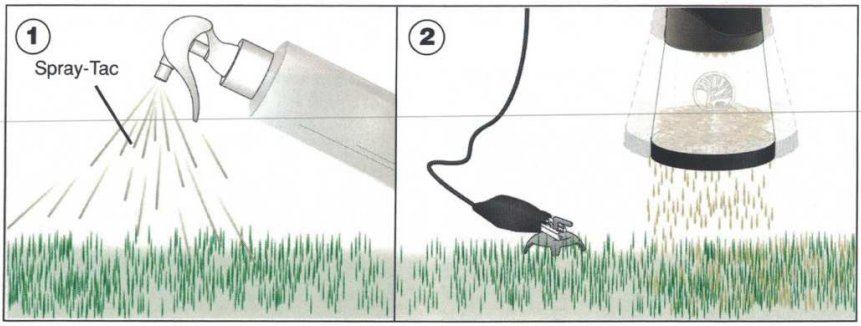
Attach Plant Hues and Flowers

① Use Spray-Tac to mist the areas you wish to accent with Plant Hues and Flowers.
② Sprinkle Plant Hues and Flowers over the Spray-Tac. For heavy applications, seal Plant Hues and Flowers in place with another coat of Spray-Tac.



Thicken Pre-Installed Static Grass

Use Spray-Tac to make pre-installed, dried Static Grass patches thicker, taller or change the color. Mist the dry Static Grass patch with Spray-Tac, coating the area thoroughly. Apply new Static Grass over the wet Static Grass. Let it dry before removing excess. Do not use Spray-Tac as the base adhesive directly on the terrain shell.



Attaching with Tuft-Tac

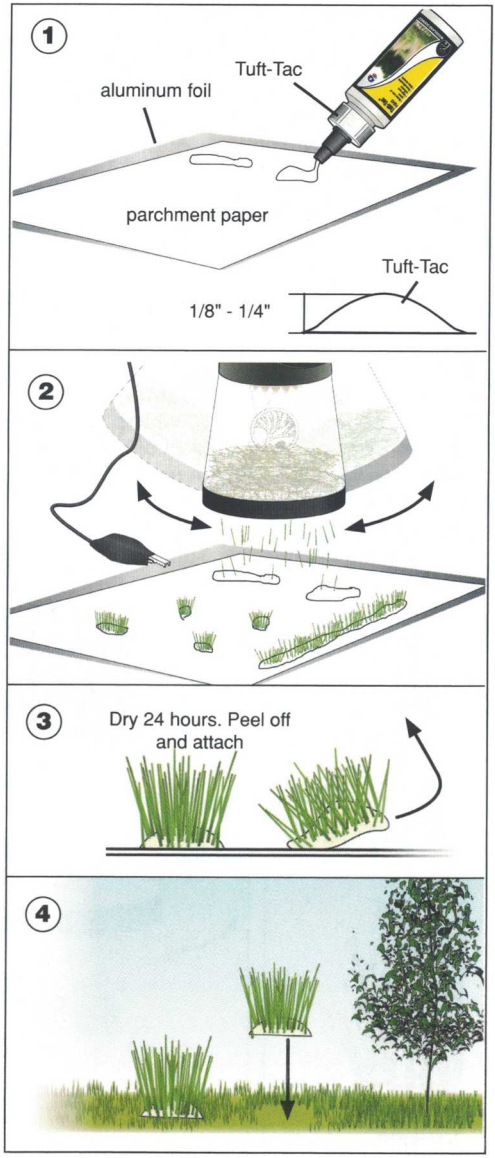
Tuft-Tac is specially formulated for making Static Grass or Field Grass tufts. Tufts have a sticky base that allows them to be peeled up and individually placed where desired. Tufts are a fast and easy way to add clumps and strips of grass anywhere on a layout. Use tufts to accent gravel roads, railroad tracks and hard to reach places. Tuft-Tac is also used to attach Plant Hues, Flowers and Static Grass to the tips of pre-installed Static Grass for exceptionally realistic seeding and flowering grasses and weeds. It can also be used as a base adhesive.

Static Grass Tufts

Lay a piece of parchment paper (not wax paper, only baking parchment paper) over a piece of aluminum foil or a metal cookie sheet. Squeeze drops or strips of Tuft-Tac onto the parchment paper. The Tuft-Tac should be between 1/8"-1/4" thick. Attach the Alligator Clip on the Ground Wire to the aluminum foil or cookie sheet and use the Static King to apply Static Grass to the Tuft-Tac. Turn the parchment paper over and shake off the excess Static Grass. Apply more Static Grass for thicker coverage.

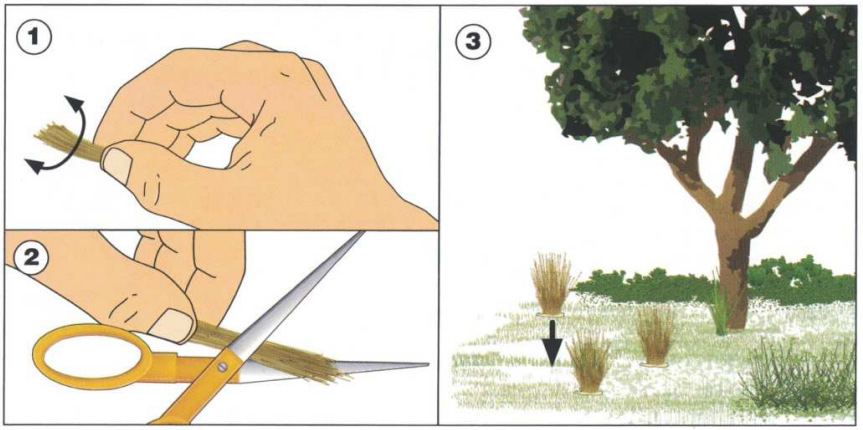
Allow Tuft-Tac to dry a minimum of 24 hours or until the adhesive has dried translucent. You can place a fan on the tufts to encourage drying. Turn the parchment paper over to check if Tuft-Tac has dried. If any white is visible through the parchment paper, the tuft is not dry.

Once dry, gently peel the tufts or grass strips from the parchment paper. Press the tuft onto the colored plaster terrain shell where desired. On landscaped layouts, scrape away any Turf or landscaping and spread a small drop of Tuft-Tac onto the application area to firmly secure the tuft. For efficiency, we recommend making several tufts at one time. Any tufts that won't be installed immediately should be left on the parchment paper for use at a later date.



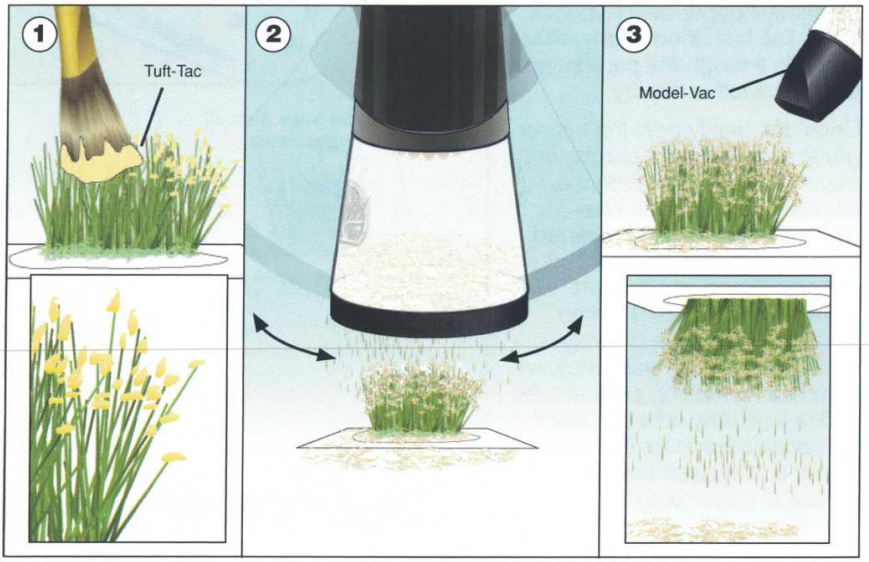
Field Grass Tufts

Pull a small bunch of Field Grass from the package. Roll the tuft between your fingers to make the tips of the Field Grass uneven. While holding the tuft, trim the Field Grass to the desired height. Dip the cut end of the tuft into Tuft-Tac (Scenic Glue and Hob-e-Tac can also be used) and plant on the layout as desired. Field Grass tufts can also be placed on a piece of parchment paper so they can be peeled off individually and placed at a later date.



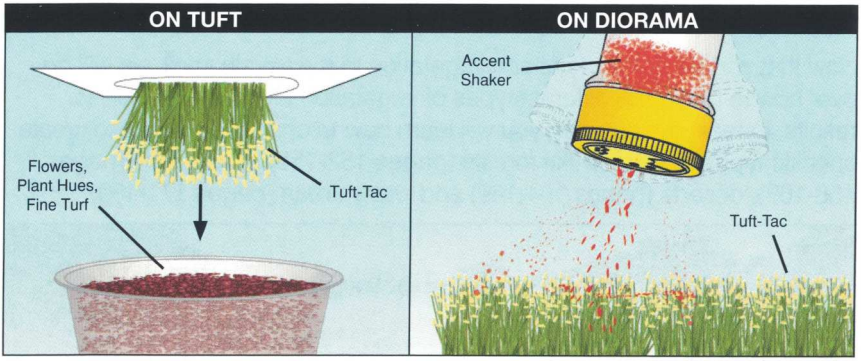
Seeding Grasses and Weeds

Once dry, Tufts can be accented with Static Grass or Plant Hues to create the effect of seeding grasses or weeds. Dip a small bristle paintbrush in Tuft-Tac and brush a very small amount of adhesive onto the tips of the Static Grass or Field Grass tufts. You do not need to cover the top of the whole tuft; the effect is best when only a few blades of grass are accented. Then, use the Static King to apply the Static Grass or Plant Hues. Immediately turn the parchment paper over to remove the excess. Let Tuft-Tac dry a minimum of 15 minutes before removing the tuft from the parchment paper and placing it on the layout.



Flowering Grasses and Weeds

Follow the instructions for Seeding Grasses and Weeds to apply Tuft-Tac to the tips of a Static Grass or Field Grass tuft. Then, fill a disposable cup with Flowers or Plant Hues and dip the adhesive-coated tips of grass into Flowers or Plant Hues. You can also sprinkle on the Plant Hues or Flowers for lighter coverage. Let Tuft-Tac dry a minimum of 15 minutes before removing the tuft from the parchment paper and placing it on the layout.



Tuft-Tac as a Base Adhesive

Tuft-Tac can also be used to attach Static Grass and Briar Patch directly on the terrain shell, just like Static-Tac. As it dries, Tuft-Tac remains flexible and tacky. Its flexibility allows a modeler to create a windswept look or striped patterns in lawns after Tuft-Tac has fully dried. Apply Static Grass over Tuft-Tac just as you would with Static-Tac and let it dry. If a windswept look or striped pattern in a lawn is desired, use the thatch comb to comb the Static Grass into the desired pattern. This method can also be used on hillsides.

BASIC LANDSCAPE APPROACH

A natural landscape has vegetation of various sizes, shapes, colors and elevation. Environmental factors like water or sunlight can impact the appearance. For example, grass that is close to a water source may be a dark, vibrant green that slowly becomes lighter or even straw-colored the further it grows from the water. Keep these variables in mind when choosing colors and placing vegetation on your layout.

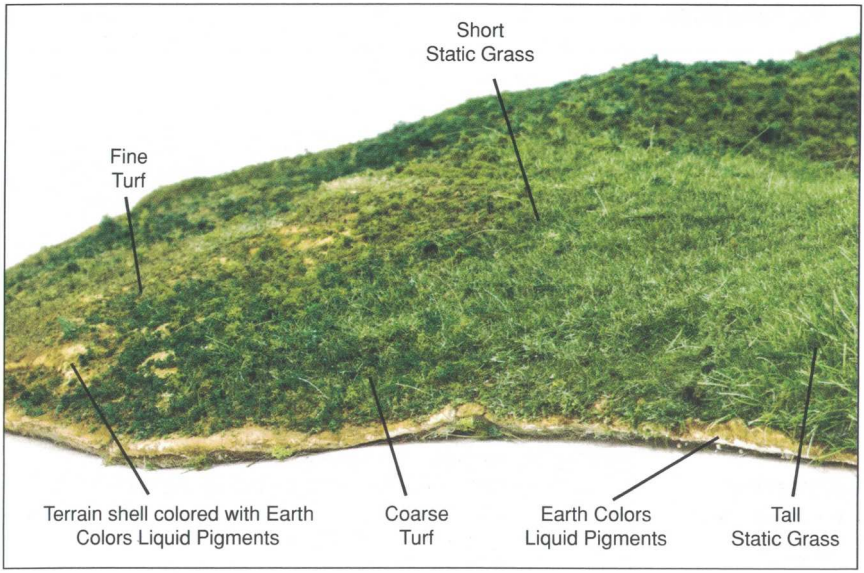
Now that you know how to attach vegetation to the terrain shell, we will go over how to blend the different types of vegetation together for realistic results. Later in the chapter, you will learn how to choose products to create specific types of biomes like forests (pages 152-155), grasslands (pages 156-163), deserts (pages 164-169) and water areas (pages 171-189).

GROUND COVER

Ground cover products like Fine Turf, Coarse Turf and Static Grass are used to model soil, grass and small weeds or plants. Ground cover should be applied over areas that are not reserved for roads, tracks, industries, buildings and water features. Begin creating ground cover by adding Fine Turf to the terrain shell. Fine Turf will blend with the terrain colors and create a dynamic, layered base for other vegetation to grow. Start with thin applications to allow the terrain shell or previous layers to show through and blend with the new layer. Experiment with different colors. If you think you have put on too much of one color, simply cover it with another color.

Coarse Turf represents small weeds and plants that are common around buildings, on mountains and hills, or along roads, railroad tracks and streams. Apply Coarse Turf over the initial layer of Fine Turf and arrange it in patches to represent weeds and other plants. Use it anywhere ground cover would be more overgrown. Start with darker colors and then use lighter colors to accent darker colors.

Static Grass represents medium height grass and weeds. When applying it directly to the terrain shell, use a thick application to avoid the terrain shell from showing through the Static Grass. For thick applications, remove excess with the Model-Vac (or flip the model over to dump) and keep shaking Static Grass over wet adhesive until it is filled. If the base adhesive is dry, use Spray-Tac to add density. Layering Static Grass over Fine, Blended and Coarse Turf is an excellent way to blend colors and textures, make dense grassy areas and create incredible realism on your layout. For more information about Static Grass, see Fields and Grasslands (pages 156-163).



CREATING UNDERGROWTH

Once the ground cover is finished, it is time to add larger vegetation or undergrowth. Undergrowth includes shrubs, bushes, field grass, brambles and vines. Products that model low to high undergrowth include Underbrush, Bushes, Clump-Foliage, Field Grass, Fine-Leaf Foliage, Briar Patch, Lichen, Foliage Clusters, Foliage, Flowering Foliage and Poly Fiber.

All of these products can be pulled apart and broken into smaller sizes or stacked to create the shapes you need. They can be added to pre-existing layouts at any time. For new layouts, begin adding smaller-sized vegetation first, then larger. This will allow you to continue building layers of color and texture. To enhance realism, use various colors of each product to show various stages and types of plant life.

UNDERGROWTH	
Underbrush	• Model bushy weeds and plants beneath shrubs • Camouflage building foundations or terrain construction flaws • Most realistic when applied in bunches or clumps
Bushes and Clump-Foliage	• Model medium to high undergrowth • Place against underbrush to create texture and height variation • Apply Bushes first, then the larger Clump-Foliage
Foliage Clusters	• Largest undergrowth products • Layer different colors to blend landscape • Stack for height variation
Lichen	• Unique texture • Model bushes with fewer leaves • Make brushy areas or tree masses
Poly Fiber, Flowering Foliage and Foliage	• Create vines and low undergrowth – **Poly Fiber**- model vines with smaller, delicate stems • Separate layers and stretch until thin and lacy • Add Fine/Coarse Turf with Scenic Cement to adjust color and texture • Twist and stretch to make thin, hanging vines like on cliffs – **Flowering Foliage**- model flowering plants • Place along roadsides, near railroad tracks, etc. for instant pop of color – **Foliage**- comes in dense sheet • Trim into hedge-like bushes • Stretch until thin and lacy for ivy
Briar Patch	• Pull apart to create small brambles and install with Static-Tac • Create thorny brambles in fields – Spread Static-Tac and press Briar Patch in place – Apply Static Grass immediately before Static-Tac dries • Scatter excess crumbles under trees and seal with Scenic Cement
Fine-Leaf Foliage	• Model a variety of shrubs, bushes and saplings with branches • Strip smaller branches and place in piles to create thickets, hedges or brush • Remove lower leaves from stem to create saplings

LANDSCAPE ACCENTS

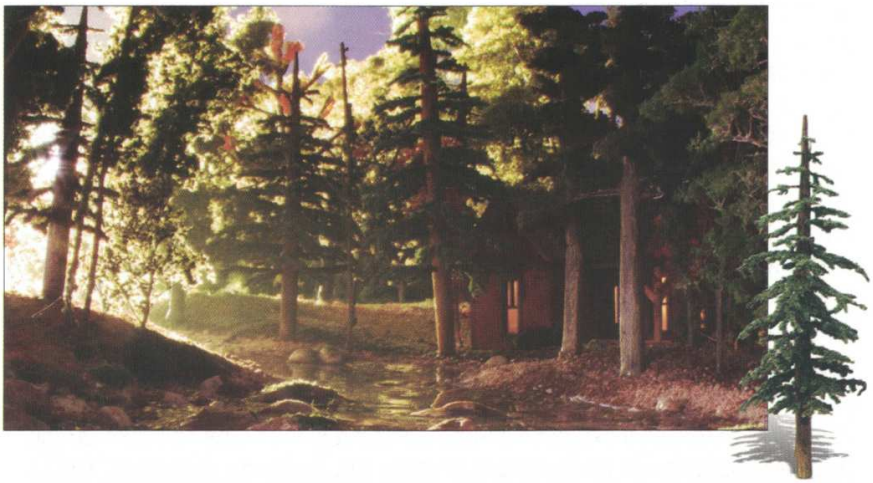
Dead Fall, Cut Stumps, Broken Stumps, Flowers, Pollen, Fruit and Plant Hues accent landscape features that are already installed. Accenting your landscape will be one of the last things you do to your layout. Use these products after all large landscape items have been added.

Accent forests and other areas where trees are located with debris like broken limbs, rotting logs or tree stumps. Cut Stumps simulate sawed trees. Install Cut Stumps anywhere a farmer might need to clear his land or in cities where a large tree may have endangered surrounding buildings. Broken Stumps are more naturally broken and model trees that died from natural causes. Install Broken Stumps at the edges of forests and in tree clumps. Dead Fall simulates broken limbs and weathered, rotting logs in forests. Install these where visible in forests and anywhere there may be tree debris. Use Dead Fall anywhere a tree is installed and in waterways to show debris left behind by flooding or logging (page 181).

Many landscapes have small pops of color in the form of flowers. Sprinkle Flowers or Pollen on your layout anywhere some color variation is needed. Plant Hues creates more subtle variation. Use Plant Hues to make subtle color adjustments on Static Grass or other landscaping materials. The colors are more muted than Pollen or Flowers and can create the look of tree pollen. Fruit models fruiting trees, shrubs or bushes. Use Fruit to create orchards and smaller plant life that produces fruit.

TREES

Trees add life, realism and perspective to dioramas. The more variety in types and colors, the more realistic the scenery will look. Some trees are ready to be placed on a layout as soon as they leave the package, while other options like Tree Kits will require building the trees yourself.



Model Scaler
Free scale conversion app for your smartphone, tablet or PC. Fast and easy Model Scaler instantly converts U.S. Customary and Metric measurements for any scale. Download free at woodlandscenics.com.

READY-MADE TREES™

Ready-Made Trees require no assembly and are available in Premium Trees, Ready Made Realistic Trees, Woodland Classics, and Ready Made Trees Value Packs. These trees vary from 3/4" to 9" in height.

Product Overview

Premium Trees™

Premium Tree are handcrafted works of art that replicate specific trees, such as Evergreen, Sycamore and Aspen. These high-quality trees are available in over 25 different options and range from 1 1/2" to 6" in height. Premium Trees feature distinctive branch and leaf structures that make it easy to identify the species of tree. These trees are great for stand-alone trees on your diorama that will draw attention.

Woodland Classics®

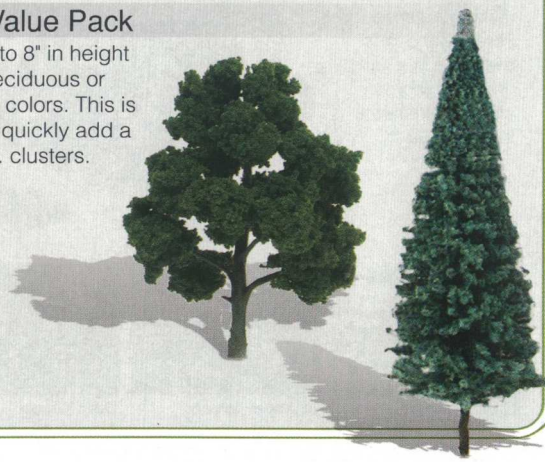
Woodland Classics are handcrafted trees that offer classic appeal and economic pricing. These trees represent a multitude of realistic shapes and branching forms. Woodland Classics are available in 15 different options ranging from 3/4" to 9" in height.

Ready Made Realistic Trees™

Ready Made Realistic Trees are available in 5 different colors and range from 3/4" to 9" in height. The natural colors and realistic textures are perfect for blending with other landscape products. Using more than one color of these trees will give you a varied appearance, which looks great when the trees are planted in clusters.

Ready Made Trees Value Pack

These trees range from 3/4" to 8" in height and you can choose from deciduous or conifer in a variety of natural colors. This is the most economical way to quickly add a group of trees to your layout. clusters.



TREE KITS

Tree Kits offer great versatility and a variety of foliage to create trees of any size, shape, color and type. Each kit includes either plastic or lead-free metal tree armatures.

Product Overview

Realistic Tree Kits™

Realistic Tree Kits are an easy way to learn how to make unique Deciduous or Pine Trees. There are 9 options depending on color and number of trees in a package. Each kit includes plenty of foliage and tree armatures of varying height. Tree heights range from 3/4" to 8".

Light Green

Medium Green

Dark Green

Conifer Green

Forest Green

Forest Canopy™

Forest Canopy is a natural product that can have a variety of uses on your layout. Forest Canopy can model trees all the way up to 6" in height. In addition to making shrubs, bushes, dead trees or individual trees, this is also a great product for making a dense forest. Forest Canopy is available in a variety of colors so you can model forests in any season.

Light Green

Medium Green

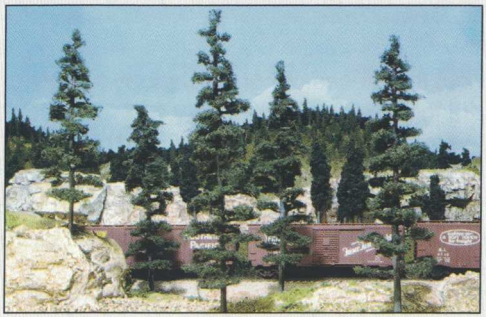
Dark Green

Autumn Mix

Large Tree Kits

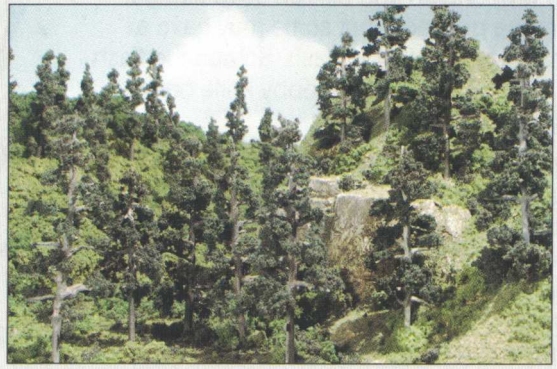
Large Tree Kits come with foliage and bendable lead-free metal armatures. These armatures are highly detailed and can be painted to suit your needs.

Tree heights range from 6" to 9". There are four options of Large Tree Kits for modeling deciduous, conifer or hedgerow trees.



Forest Kits

Forest Kits are a great economical option for modeling a larger number of trees. These kits create Hardwood or Pine forests with trees ranging from 2" to 4" in height. Each kit contains foliage and 24 white metal tree armatures that you can paint as desired. Forest Kits are perfect for creating vast forest areas because the cost per tree is so inexpensive.



TREE ARMATURES

Tree Armatures

Tree Armatures are a highly customizable option for creating your own trees. They work well for forests as well as one important stand-alone tree. Tree Armatures are available in sizes ranging from 3/4" to 7" in height, and you can choose between Pine and Deciduous trees. These armatures are bendable, realistically textured and come with a planting pin and optional base.

MAKE YOUR OWN ONLINE VIDEO

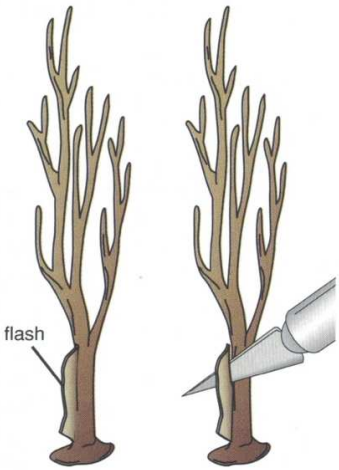
Tree Kits, Forest Kits, Forest Canopy and Tree Armatures are excellent ways to create custom trees that no one else has on their layout. Each product requires some assembly, which allows the modeler to make their own aesthetic choices. Planting trees will be discussed in the next section on page 151.

Preparing Forest Canopy

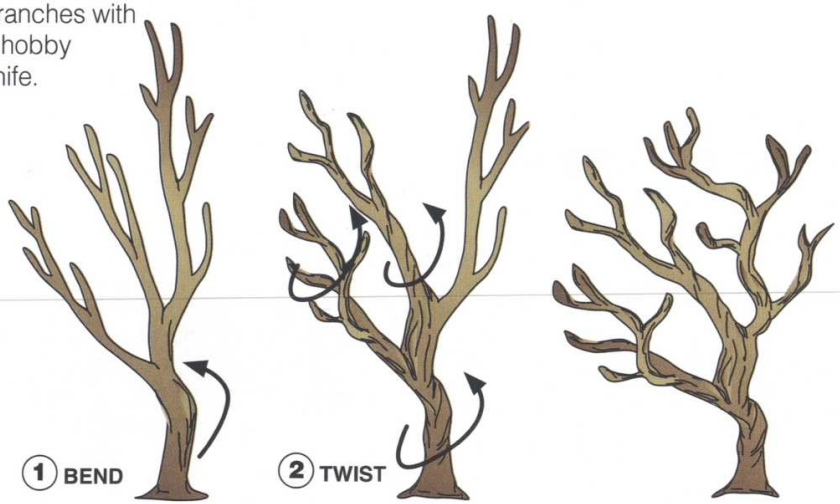
To use Forest Canopy, break or cut the pieces of Forest Canopy to the desired height and density. Shake the Scenic Cement very well and pour it into a bowl. Hold the trunk of the tree and dip each piece into the Scenic Cement. Then sprinkle Coarse Turf onto the tree top. Avoid sprinkling turf on the trunk. If additional accents are desired, mist the tree top with Scenic Cement and sprinkle on the desired color of Coarse Turf. Let Forest Canopy dry before planting.

Preparing Tree Armatures

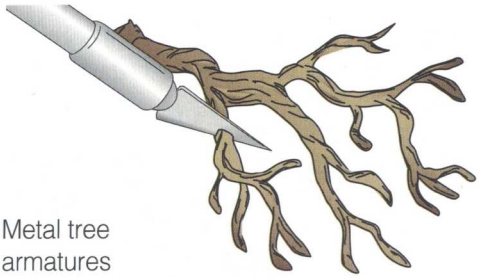
Most plastic tree armatures do not require any preparation and can be used straight from the package, but some may have a small amount of mold flash. Scrape the flash off the armature with a hobby knife before shaping the armature.



Metal armatures require different preparation. They can have a mold release residue that can prevent paint and adhesives from adhering to the armature. Be sure to wash them in warm, soapy water to remove any residual mold release agent. Then scrape any excess mold flash from the branches with a hobby knife.

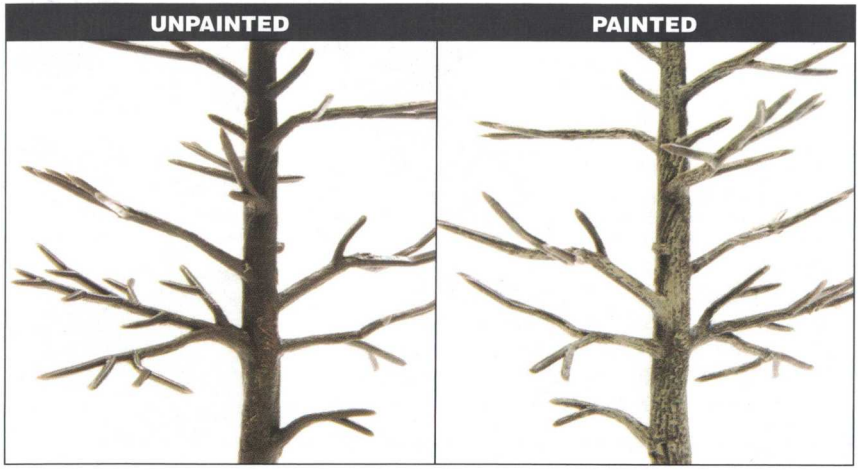


The next step is to shape the tree. Bend and twist the flat armature into a realistic 3-dimensional tree. When you are shaping the tree, remember most trees are not perfectly balanced. Their limbs stretch very low and high. Some limbs are close together and some are far apart. In nature, trees lean precariously, trunks twist and branches break. Use a hobby knife or flush cutting shears to trim branches back to create a freshly cut or broken look. Use needle-nose pliers for trunks that are difficult to bend.



Metal tree armatures must be primed and painted after they have been twisted into shape. Plastic tree armatures are already a flat brown and do not require painting, but they can be painted if desired. Painting the tree armature is an opportunity to create natural variation and bark textures. Prime and paint the tree armature with a matte acrylic or enamel paint. If using acrylic paint on plastic armatures, wash the armature with soapy water to remove residual mold release agent from the plastic. This will ensure the acrylic bonds with the plastic.

To create realistic bark texture, use the drybrush technique (page 112) with multiple shades of grey or brown to simulate different shades of bark. Start by painting the whole trunk black. Then drybrush a brown shade over the black and a grey shade over the brown, leaving some black and brown showing through. After the paint has dried, the armature is ready for foliage.



Attaching Foliage with Hob-e-Tac

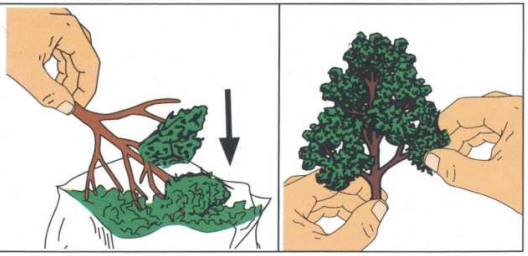
Tree foliage typically grows toward the top of branches. When you look at most trees, you will notice some sky visible between leaves and branches. The foliage on tree armatures should mimic this pattern of growth. Tree Kits and Forest Kits come with foliage products ready to attach to the armature. For Tree Armatures, use Foliage, Underbrush, Bushes, Fine-Leaf Foliage, Lichen, Foliage Clusters, Forest Canopy or Clump-Foliage to create the "leaves" of the tree. Each product will have a slightly different look, so choose based on the effect you want to achieve.

Hob-e-Tac is ideal for attaching foliage to tree armatures because it is very tacky and will pick up any foliage it comes in contact with quickly and easily. Brush Hob-e-Tac on the armature branches where foliage naturally grows. Avoid getting Hob-e-Tac on the trunk. Let Hob-e-Tac dry until it is clear and tacky. Depending on thickness of the application, it will take Hob-e-Tac about 15-20 minutes to dry clear.

Once the Hob-e-Tac has dried clear, attach the foliage of your choice. Each foliage product is attached in a slightly different way, but there are three general methods:

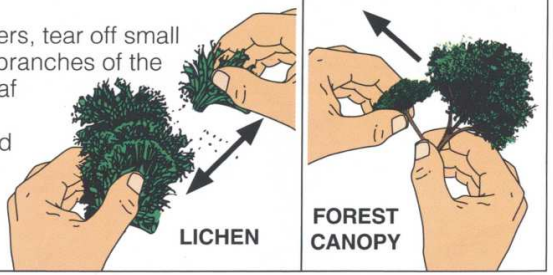
Dip

Dip the armature into Underbrush, Bushes or Clump-Foliage. Shake (or pick) off excess, then pinch foliage firmly on the branches for strong adhesion.



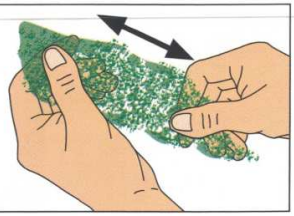
Tear

For Lichen or Foliage Clusters, tear off small pieces and press onto the branches of the armature. To apply Fine-Leaf Foliage or Forest Canopy, strip pieces off the stem and carefully press onto the Armature. Gently squeeze at the glue contact points for the best adhesion.



Stretch

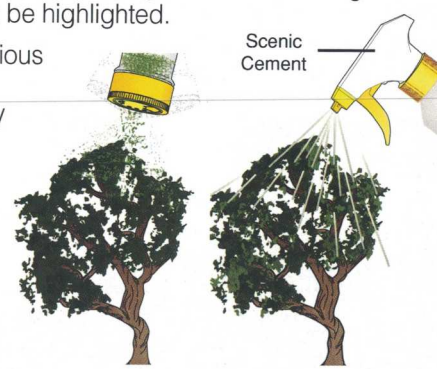
Stretch Foliage until it is very thin and lacy—almost wispy. Stretch the wisps of Foliage over and around the branches. Gently squeeze where the Foliage touches the armature to ensure it makes contact with Hob-e-Tac.



Highlighting Tree Foliage

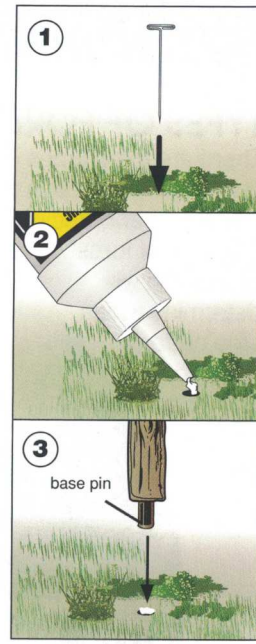
Highlighting is a modeling trick that creates visual depth in the leaves of the trees. It is an important and simple step in creating realistic tree foliage. All trees, even ready-to-plant trees, can be highlighted.

To highlight tree foliage, sprinkle various colors of Fine Turf, Plant Hues or Flowers over the tree's foliage. Spray the foliage with Scenic Cement to seal the highlight in place. Choose a lighter color to create highlights, and use darker colors for lowlights. Highlighting is highly recommended when using Foliage as the tree foliage material.



PLANTING TREES

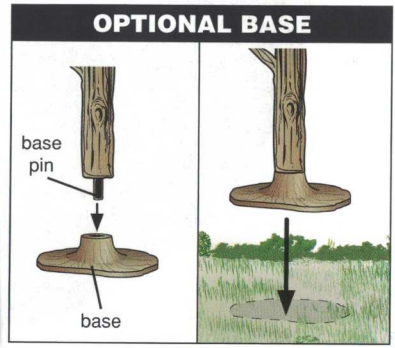
Most pre-made trees come with an optional base that allows for temporary placement. This feature makes it easy to find the right spot on the layout for the tree. Just insert the base pin on the tree into the hole on the base for temporary placement. When the permanent location is chosen, discard the optional base and poke a hole in the terrain shell. Apply a drop of Scenic Glue over the hole and plant the base pin directly into the terrain shell.



You can also glue the base directly to the terrain shell and simply insert the tree in the installed base. Or, if you are building a new project and know where a tree will be located, you can install the tree base in the plaster terrain. Use a toothpick inserted in the base to keep the hole for the pin clear of plaster. For trees without a base, simply poke a hole and plant the pin in the hole.

To plant the trees you've made with Forest Canopy or Fine-Leaf Foliage, simply poke a hole in the terrain shell, apply Scenic Glue over the hole, and insert the tree in the hole.

NOTE: If you are including a water feature, plant trees located near the water feature after the water is cured. This will prevent stray foliage pieces on the tree from falling into the water.

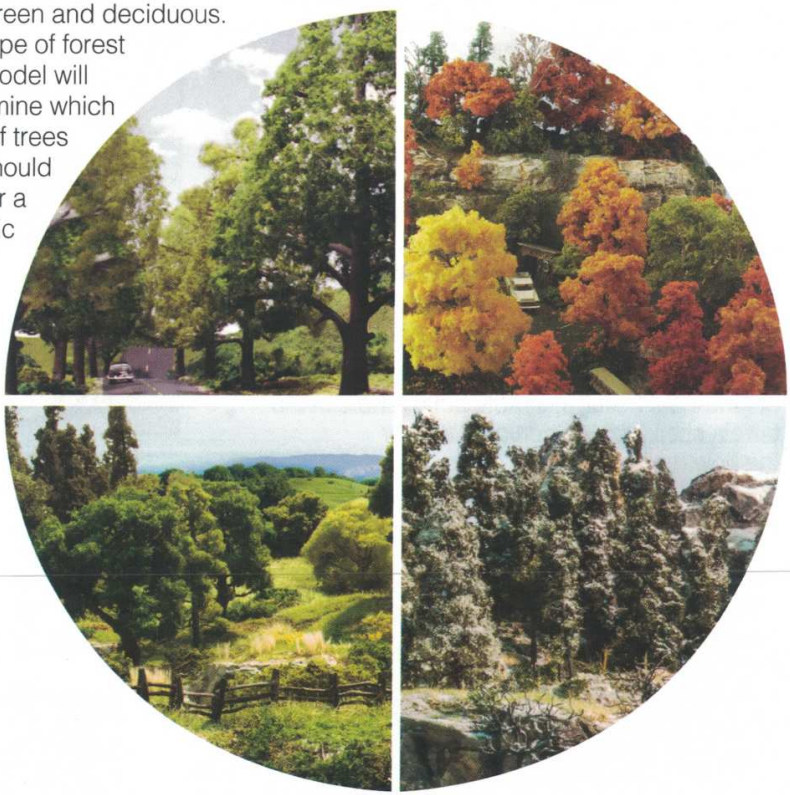


FORESTS

Depending on the location and time period of your diorama, you may want to add forests. Before you begin, you will need to consider several factors like the season, what type of forest you are modeling, how much area your forest will cover, and how tall the forest should be. These decisions will influence which products you should use to create your forest.

TYPES OF FORESTS/SEASONS

There are three types of forests: boreal (taiga), temperate and tropical. These forests contain different mixtures of three main tree types: conifer, evergreen and deciduous. The type of forest you model will determine which type of trees you should use for a realistic look.



Forests and Tree Types

Tropical forests are abundant in very warm climates that only have wet and dry seasons. They are often located close to the equator and consist primarily of broadleaf and needle evergreen trees, while deciduous trees are rare. Tropical forests are very tall and known for their thick canopies.

Boreal forests are located in cold northern areas like Siberia, Canada and Alaska. Due to the cold winter temperatures and short summers, boreal forests only consist of cold-tolerant conifer and evergreen trees like pine, fir and spruce.

Temperate forests are the dominant forest type for the Northern Hemisphere. They are found in regions with a moderate climate characterized by cold winters and warm summers. Temperate forests can be made of deciduous, conifer and evergreen trees. Conifer and evergreen trees are more common in dry climates at higher elevations, while deciduous trees are more abundant in wetter and warmer regions at lower elevations.

BROADLEAF DECIDUOUS (OAK) **EVERGREEN (SPRUCE)** **CONIFER (PINE)**

Tree Foliage

Deciduous trees have broadleaf foliage that is usually various shades of green during warmer months and change colors and drop off during seasonal cool weather changes. Deciduous trees are responsible for the brilliant yellow, orange and red colors that appear in the fall season. If you want to model bright fall colors, pick deciduous trees and colorful foliage to create your forests.

Many people confuse conifers with evergreens because they can both have needle-like foliage, but they are not the same type of tree. Conifer trees reproduce via cones and have needle foliage. They are abundant in temperate and boreal forests. Evergreen trees reproduce via flowers and have either broadleaf foliage (common in tropical forests) or needle foliage (abundant in temperate and boreal forests).

Neither conifers nor evergreens drop their foliage due to seasonal changes, but they do occasionally replenish their needles or broad leaves. When this happens, some color change can be visible but the new growth comes in green while old foliage falls off.

Creating Realistic Variation

The size and amount of detail on your trees will vary based on their location on your layout. The foreground on your layout contains features with the most detail. Anything else, like the mountain behind the town, is considered the background.

Remember no tree is exactly the same height or shape as another. Modeling trees in multiple heights creates realistic variation. Use selective compression, as necessary, to keep key features. For more information, see the Selective Compression section on page 13.

If a group of trees are part of a featured area, select tree products that further the narrative of your layout. Are you planting trees near a water feature? Pick trees that are known for loving a wet environment, such as Sycamore. For deciduous trees high in a mountain village, choose Aspen.

When viewing a forest in real life, very little branch material is visible, and you almost never see tree trunks unless walking in the forest. In modeling, you want to plant trees as close together as possible to make the trees look like a mass in the background of your layout. These trees can be less detailed than foreground trees.

To avoid individually planting multiple trees, use products like Forest Canopy and Foliage Clusters to quickly create a forest. Group these products together in dense clumps in the background of your layout. To make the forest taller, glue shorter pieces of Forest Canopy or stack additional Foliage Clusters to the top of the tree mass.

For continuity between the foreground and the background, you may want to purchase trees with foliage similar to the foreground. Install these throughout the background forest. You can also highlight the forest with Fine and Coarse Turf.

It can be difficult to find models of certain kinds of trees. For unique or rare trees, scratch build the tree with copper wire or any flexible metal wire. A quick way to do this is to cut a wire strand double the length you want, and fold it in half. Twist the two strands together to create the trunk, leaving a loop on one end. When the trunk is how you like it, cut the loop and twist the wires to form branches or roots.

When satisfied with the shape, coat the twisted wiring with Flex Paste and let dry. Then paint the Flex Paste with an acrylic paint (black is recommended). Dry brush some bark onto the tree with appropriate colors for the tree you are making. Finally, attach your choice of foliage as described in the "Attaching Foliage with Hob-e-Tac" section (page 150).

Your forest will not be complete without forest debris, such as dead trees (not yet fallen), decomposing logs and broken limbs. Separate Dead Fall into small and large pieces. Large pieces can be placed in the Turf on the terrain shell like rotting logs. Sprinkle with Fine Turf to create moss. Scatter smaller pieces of Dead Fall around the larger pieces to simulate broken tree limbs. Save the smallest pieces to scatter under trees to model very small, broken branches and twigs. Sprinkle some Coarse Turf around these pieces if the limbs would have fallen recently.

Depending on the season, the trees on your layout may be flowering or fruiting. Sprinkle Flowers on trees in the foreground and background to create a flowering effect. Add Fruit on trees around farms that may have orchards. Sprinkle fallen fruit on the terrain shell. Use different colors of Fine Turf to highlight trees with yellow-green pollen and create variation.

Sunlight makes the foliage on the tops of trees look brighter than the foliage underneath. Replicate this effect by highlighting the tops of trees with Yellow Grass Fine Turf. This simple step will heighten the realism of your trees and forests.

FIELDS AND GRASSLANDS

Grasses are present everywhere from farming pastures, meadows and fields to a golf course or your carefully trimmed lawn. Forest meadows and fields can be overgrown, while farming pastures and lawns are usually more manicured. These areas can be small, but there are also vast grassy areas called grasslands.

There are two types of grasslands—temperate and savannah. Temperate grasslands, like the North American Prairie, teem with several varieties of grasses and flowering broadleaf plants. Few trees grow in temperate grasslands, and the trees that do are usually along waterlines. Unlike temperate grasslands, savannahs are primarily made up of only one or two kinds of grass in one area. Savannahs, like the African Savanna, have scattered deciduous trees and shrubs that grow in groups and tufts.

Grasses in the spring tend to be bright green, with some dead thatch beneath. In the summer, grass stalks become a deeper green and develop seed heads. When seed heads mature at the end of summer, they tend to change colors ranging from rich reds and browns to light straw. The stalks of grass begin to yellow in late summer and throughout fall. Grasses that exist in temperate climates die back during winter and turn straw and brown colors.

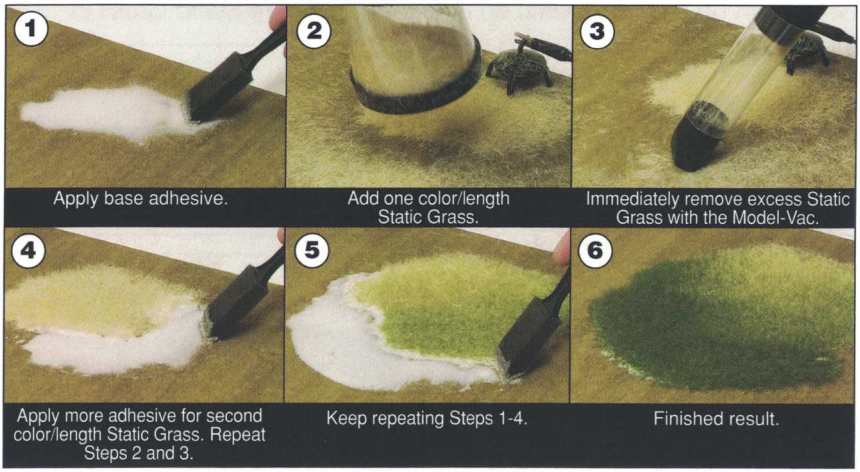
Consider the location and season of your model when choosing products and colors to create grassy areas. The same methods to make a prairie are also used to make a small lawn or golf course.

BLENDING

There is rarely one height and color of grass in a given area. Think of a pond. Grass near the water line tends to be a darker green than grass on the hillside nearby. Even the green grasses next to the water line have slight color and height variation. This happens everywhere due to inconsistencies in available nutrients, the amount of available water, how much sunlight is received and even different varieties of grasses. There are two general techniques that can be used to blend colors and heights in grassy areas.

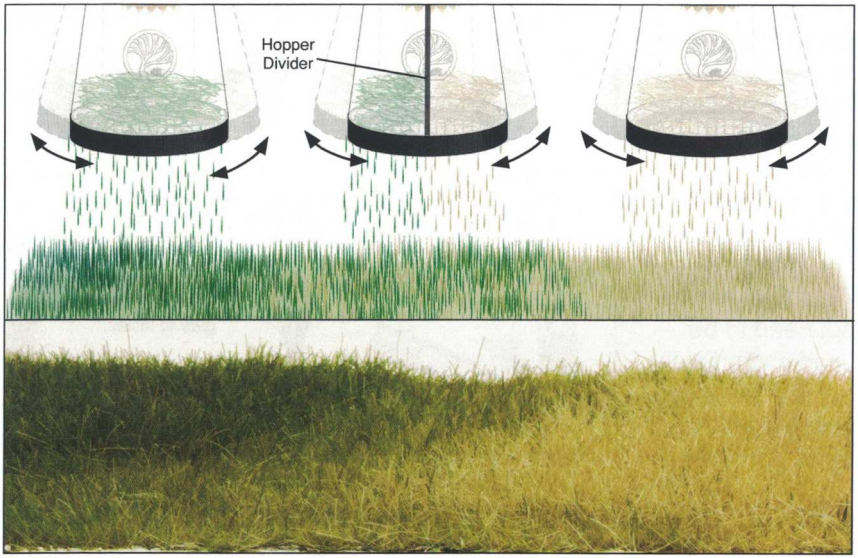
Blending with Base Adhesive

Use the base adhesive to control where different heights and colors are applied. To do this, apply the base adhesive in one patch. Then add one color or length of Static Grass over that patch. Apply more adhesive, pushing it into the edge of the already installed Static Grass. Add the second color or height over the second patch of adhesive. Continue this pattern until you have a whole field or lawn covered. This method will create a blended appearance and is great for controlling where Static Grass is installed.



Blending with Hopper Divider

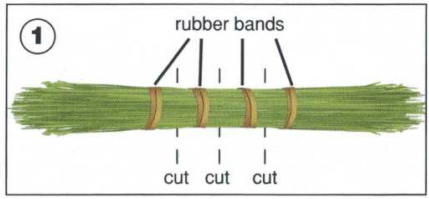
Using the hopper divider, load two different heights or colors of Static Grass in the Static King hopper, and apply it in one area. This is a quick way to create realistically blended grasses.

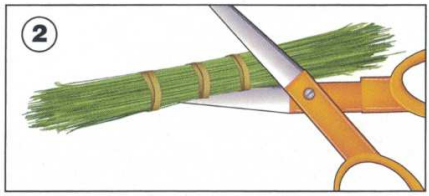


MODELING TALL GRASSES ONLINE VIDEO

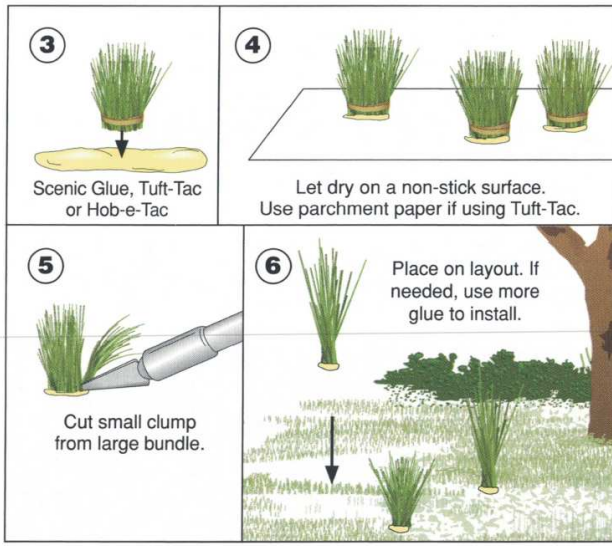
Temperate grasslands and savannahs contain very tall grasses that can grow from 4'-10'. Try using Field Grass when you need to model exceptionally tall grasses.

Field Grass is ideal for modeling tufts of tall grass and is approximately 2 1/2" to 3" long. Field Grass can be trimmed to any length. The colors of Field Grass are different than Static Grass and can be mixed together to create variation within an individual tuft of grass. Field Grass can be used to create an entire field, accent Static Grass in the field for texture and color variation, or simply add small accents along roads, railroad tracks and buildings.





Field Grass can be placed in individual tufts on a layout and attached with your choice of Tuft-Tac, Scenic Glue or Hob-e-Tac (pages 104-105). Individual placement can be time-consuming. To make Field Grass tufts faster, roll a large clump of Field Grass into a bundle. Wrap 3-4 rubber bands around the bundle, spaced evenly at the approximate height you want the Field Grass. With Scissors, cut the bundle between the rubber bands. Dip the cut ends of Field Grass into the adhesive and place on a non-stick surface (use parchment paper for Tuft-Tac). When you are ready to plant your Field Grass, peel (or cut) off small tufts from the large bundle. If you used Scenic Glue, dip the small tuft into a little more Scenic Glue and place on the layout. If you used Hob-e-Tac or Tuft-Tac, the adhesive will remain sticky, and the small tuft can be placed on the terrain shell. The bundle of Field Grass does not need to be used immediately but can be used over the course of several months.

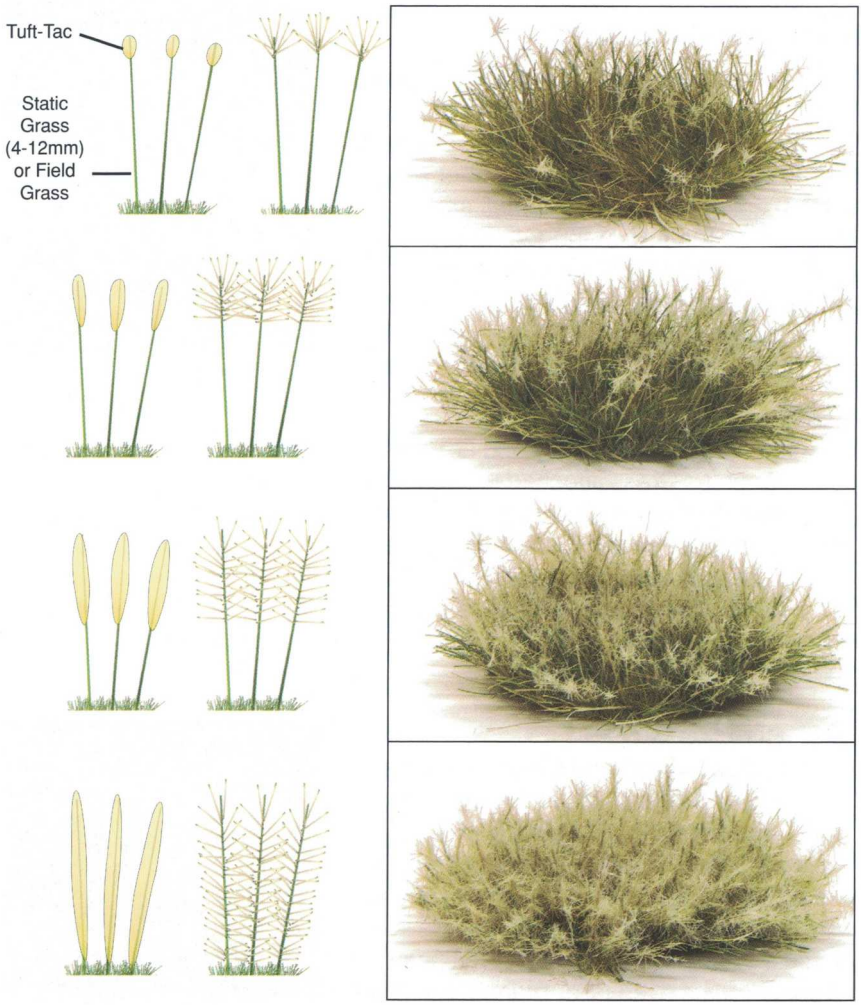


MAKING/ACCENTING TUFTS ONLINE VIDEO

Most grasses and weeds produce colorful seed heads or small flowers. Red switch is a great example of grass that creates dramatic and colorful seed heads. Other grasses and plants like dandelions produce seed heads that are fluffy and float above surrounding grasses. Cattails are another plant that produce a distinctive seed head. A realistic prairie, meadow or lawn will have these features.

Grasses and weeds in this late stage of development can be modeled with Static Grass and Field Grass tufts (pages 125-126). Tufts are easier to handle and allow you to experiment without permanently installing on your layout.

Different plants can be created by controlling where the Tuft-Tac is applied on the Static Grass blade. Use this chart to help you determine what kind of look you want to create.



Follow these tips to create specific seeding and flowering grasses, or broadleaf weeds and plants.

Compact Seed Heads (Cattails)

Attach Plant Hues to the tips of Static Grass or to Field Grass. This will create tightly bound seed heads that are close to the grass or plant's stalk.

This technique is great for making cattails. To create a cattail brown, mix 1/4 tsp of Golden, 1 1/2 tsp of Red Switch, and 2 tsp Shadow Green Plant Hues together in a clear plastic bag. Apply a small amount of Tuft-Tac on the tips of the tuft. Then use the Static King to apply this mixture to the pre-made tuft, or leave it in a cup and dip the tuft in the mixture.

Fluffy Seed Heads

For seed heads that are fluffy and appear to float above low-growing grasses, use 2mm Static Grass attached to Field Grass or 4-12mm Static Grass. 2mm Straw is recommended for dry grasses nearing the end of their life cycle. For a floating appearance, create a tuft with 4mm-7mm as undergrowth and 12mm as the top growth. Paint the Tuft-Tac onto the top most tips of the grasses. Then apply the 2mm to the tips of the grass tuft. If you prefer a bushier look, paint the Tuft-Tac farther down the Static Grass stalk.

Branch-Like Stalks

For broadleaf weeds and plants that appear to have branch-like stalks at the top, use 2mm, 4mm or 7mm Light Green, Medium Green and Dark Green. The larger the Static Grass, the more weed and plant-like the tuft will appear after application. Once this layer of Static Grass has dried, add additional layers to create even taller branch-like stalks.

Blooming Plants

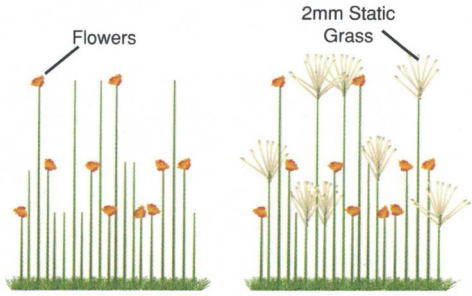
To model blooming plants, use Plant Hues and Flowers to accent 2mm Static Grass already installed on the tips of a tuft. This creates the effect of seed clusters and flowers on branchy plants.

Overgrown Grass and Large Flowering Plants

Attach 12mm Static Grass to the tips of other pre-installed Static Grass to make the application taller and more overgrown. Layer more Static Grass, Plant Hues and Flowers to create large flowering plants or very tall grasses.

Flowers and Seed Heads

To create flowers and seed heads, dab Tuft-Tac glue only on some of the tallest Static Grass stalks. Dip these stalks into Flowers or Plant Hues. Let it dry, and then paint Tuft-Tac on other tall grass stalks. Apply 2mm Static Grass on those tips. The effect will look like flowers growing up through seeding grasses.



Small Broadleaf Plants

Paint Tuft-Tac over a very thin tuft of Field Grass, almost down to the base adhesive. Then dip the whole Field Grass tuft into Coarse Turf. The Field Grass tuft will resemble small broadleaf plants and saplings.

CREATING REALISTIC VARIATION

Brambles and broadleaf plants create natural variation in grassy areas. Savannahs and temperate grasslands are both known to have broadleaf plants. Meadows, fields and lawns all have plants like shrubs, bushes and brambles living in and around them. To create this kind of variation, follow these tips.

Broadleaf Plant Life

Plant Field Grass tufts that look like saplings in fields and along the edges of fields to model tall broadleaf plant life and saplings.

Plant Life Along Tree Lines

Place Underbrush, Bushes and Briar Patch on the edges of groups of trees to represent bushes and brambles reaching for sunlight. Grasses don't typically grow all the way up to the base of a tree trunk, so leave some Earth colored Turf underneath.

Undergrowth

Layer Static Grass over Fine and Coarse Turf to create the appearance of undergrowth beneath the grass. A sparse layer of Static Grass over the Turf will look like there is a thick undergrowth of weeds beneath the Static Grass. Sprinkle Fine or Coarse Turf over the thick applications of Static Grass to create the look of broadleaf plants and weeds that are reaching through the grasses for sunlight.

Animal Paths

Leave bare spots in fields where animals like cows or deer trample the grass. If you are adding these pathways after installation, use the thatch comb to remove and press down the Static Grass to create a matted look.

Fence Lines

Grasses along fence lines tend to be tall because the mower cannot get close enough to the fence. Use Tufts to install tall grasses or apply Static Grass in stages, starting with the taller grass along the fence line.

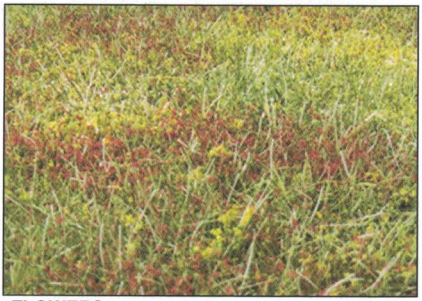
Grasses Over Rocky Areas

Apply Static Grass over Ballast, Talus or Gravel along railways and roadways to create the look of grass growing through the rock. Small tufts of grass can be added between rail ties. Make the tuft short enough for a train to pass over without derailing. Trim the tuft with scissors to adjust the height. Use tufts to add grassy strips down gravel roads and weeds popping out of broken sidewalks.

Finishing Grassy Areas

Finish grassy areas with a light sprinkle of Plant Hues, Fine and Coarse Turf, or Flowers. This will add subtle highlights and lowlights to a grassy area.

PLANT HUES



FLOWERS

FINE TURF

COARSE TURF

DESERTS

Deserts are typically hot and dry with limited plant life, but that does not make them any less impressive. Locations like the Grand Canyon, Australian Outback or the Sahara Desert are known for their unique landscape and colors. Modeling a desert will require some creativity and a willingness to experiment with colors and products.

MIXING PRODUCTS FOR CUSTOM COLORS

To model a realistic desert, you will need to think outside of a product's primary use. Desert soils are rocky and gravelly, ranging from red and brown to light tan. These colors can be persistent across the whole horizon, or they can be striped or dotted throughout. Use reference photos to identify what soil colors are in the specific desert you want to model. Find similar colors of Earth Colors Liquid Pigment and other products like Turf, Plant Hues, Gravel, Talus, Ballast and Static Grass.

Start by coloring the terrain shell with Earth Colors Liquid Pigment as you normally would. Pick the color that best represents the type of desert you are modeling. As deserts are very rocky, you may want more of the terrain shell to show through than would be present in other scenes. Try opaque coloring to create deep, rich desert terrain colors. Mix pigments together to create custom colors.

Next, you will need to install ground cover over the colored terrain shell. Using a mixture of materials will help create natural variation and interest. Mix the following suggested products in a clear, sealable plastic bag until they match the colors in your reference photos. Then, sprinkle them over the terrain shell or flyspeck onto cliffs and hillsides:

- **For gray and whitish deserts-** Use Buff Fine Gravel mixed with either Soft Flake Snow™ (for a bright white) or Buff Fine Ballast (for a whitish tan look).
- **For tan deserts-** Use Buff Fine Ballast mixed with Earth or Yellow Grass Fine Turf. Yellow Grass Fine Turf can be used for highlights and Earth Fine Turf for lowlights. For some darker, coarser texture, add a little Brown Fine Ballast.
- **For reddish desert features-** Use Iron Ore and Brown Fine Ballast layered or mixed with Buff Fine Ballast.

BUFF GRAVEL AND SOFT FLAKE SNOW

BUFF GRAVEL AND BUFF BALLAST

BUFF BALLAST

BUFF BALLAST AND YELLOW GRASS FINE TURF

BUFF BALLAST AND EARTH FINE TURF

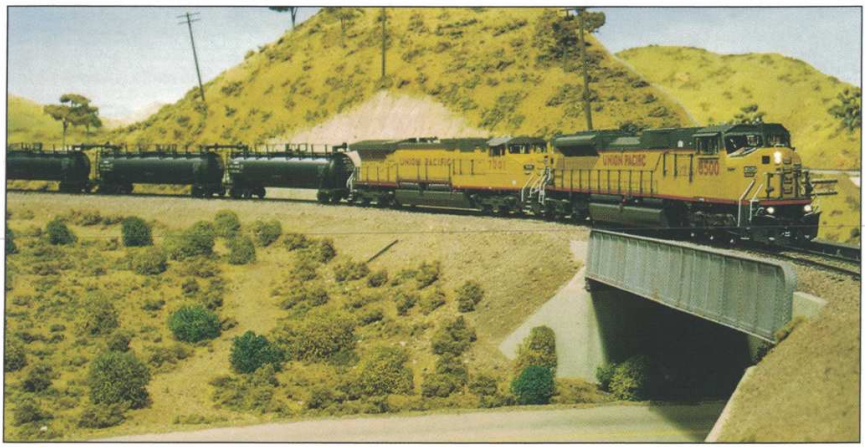
BUFF BALLAST, BROWN BALLAST AND IRON ORE BALLAST

BROWN BALLAST AND IRON ORE BALLAST

Accenting the Soil Colors

Accenting the desert soil ground cover with different colors or coarser materials will add texture and realism. You can accent desert soil in a variety of ways. Follow the color and texture suggestions below to accent your desert ground cover. Mix the materials in a sealable plastic bag. Then shake the bag until the color is uniform. For fine texture-materials, like Plant Hues, Accent Powder or Fine Turf, use a dry brush and paint them on. Using a dry brush will control the application. If you do not need to control the application, sprinkle the materials on.

- Use Accent Powder, included in the Gravel (page 107) package, to add tan colored lowlights (in light colored deserts) or highlights (in darker colored deserts).
- Mix Golden, Wheat and a small amount of Red Switch Plant Hues (page 130) together. This will create a reddish-light brown mixture. Use this mixture to highlight reddish deserts or add lowlights to a whitish desert.
- Mix Red Switch and Golden Plant Hues together. This will create a red-rust color. Use the mixture to highlight reddish-brown desert soil.
- Use Burnt Grass or Green Grass Fine Turf to add small patches of low-growing plant life. Use sparingly.
- Some deserts, like in Nevada and Arizona, have red, orange, yellow or green colors in the rocks and soil. For reddish-yellow areas, mix Red, Orange or Yellow Flowers with Brown and Iron Ore Ballast until the desired color is achieved. For areas with more green, mix Green Grass and Burnt Grass Fine Turf with Yellow Flowers until the desired color is achieved.
- Add coarser Ballast on top of the ground cover to emphasize rocky areas. For reddish desert rocks, use different sizes of Iron Ore, Brown and Dark Brown Ballast. Use varying sizes of Buff, Light Gray and Gray Blend Ballast for whitish or tan-colored deserts.
- Use Talus where you need more naturally shaped rocks. You can use the available colors individually or mix them together. Color the Talus for unique desert rocks. Follow the instructions in the Talus section to color Talus with Liquid Pigment (page 121).



DESERT PLANT LIFE

Once you have the terrain soil installed, it is time to add plant life. There are very few plants that exist in deserts, the most common of which is cacti. Desert plant life is often sparse and scattered across the terrain in small groups or as individual plants. For more varied vegetation that is less spread out, consider including an oasis in your desert.

CACTI AND DESERT TREES

Cacti are a large part of desert life because they store a lot of water that can be used over a long period of time.

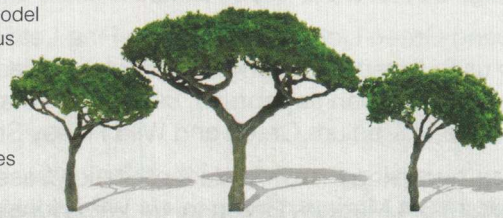
Product Overview

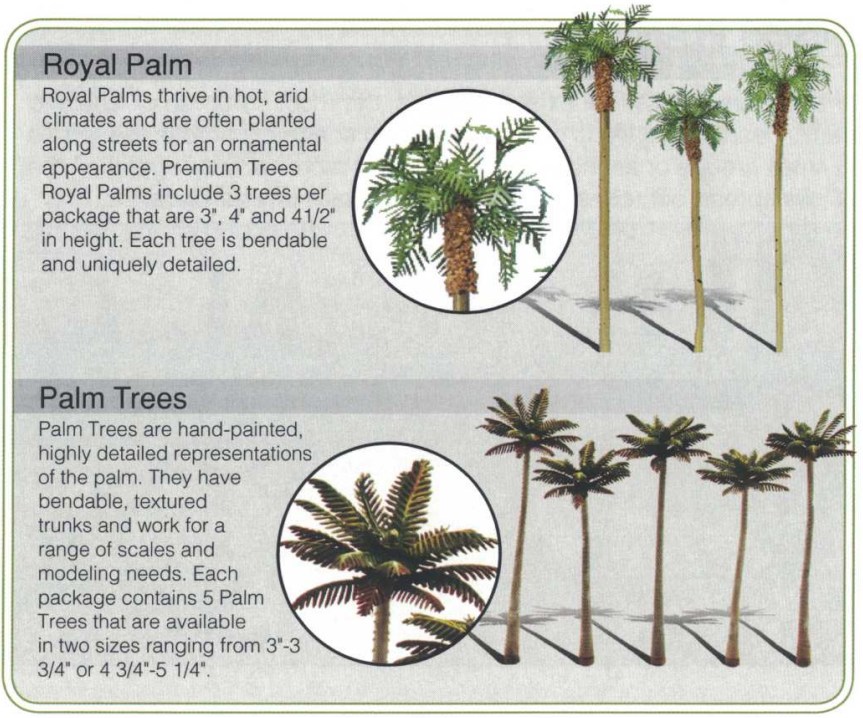
Cactus Plants

Cactus Plants include 13 cacti per package. These include saguaro, prickly pear, barrel and columnar cacti. Attach Cactus Plants with Scenic Glue. Plant cacti in dry, flat areas away from any water sources.

Canopy Trees

Canopy Trees can be used to model Stone Pines, which are coniferous trees that thrive in sunlight and dry soil. These trees are easily recognized by the umbrella shape of their canopy. Woodland Classics Canopy Trees include three trees per package that are 2" to 3 1/2" in height.





Cactus Plants, Canopy Trees, Palm Trees and Royal Palms come with a base pin and should be attached just like all other Woodland Scenics trees. See the Trees section for more information (pages 144-151).

To create other types of trees founds in deserts, use Tree Armatures with foliage products that closely match the individual tree's leaves. You can also purchase trees that look similar and modify them. Highlight trees with Fine or Coarse Turf to create the desired look. If no similar trees can be modified to suit your needs, try making your own from wire (page 155).

Sagebrush

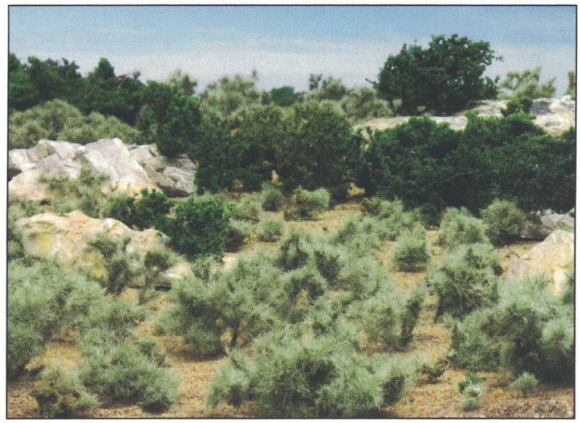
Sagebrush is a type of low-growing bush that is usually a light, silvery green with a soft texture to its foliage and purple or yellow flowers. Most sagebrush mature between 2'-4' tall in arid environments. However, some sagebrush can grow as high as 15'. Large sagebrush bushes have branches that are a woody texture and are often round and scraggly.

Spring Green Lichen, Light Green Fine-Leaf Foliage and Poly Fiber can be used to represent brighter green varieties of branchy sagebrush. For silvery green sagebrush, use Brown Briar Patch accented with a mixture of Medium Green and Wild Honey Static Grass Flock.

Start by mixing the two colors of Static Grass Flock in a cup. Make the mixture 3/4 Medium Green to 1/4 Wild Honey. Pull Briar Patch apart into sagebrush-shaped pieces. Mist Briar Patch with Spray-Tac (saturate

if thick coverage is desired) and apply the Static Grass Flock mixture over the Briar Patch with the Static King. The two colors of Flock will create a silvery green appearance and replicate the branchy leaves of the sagebrush bush. Medium Green Briar Patch can be used to replicate the darker, richer green sagebrush bushes.

Light Green Static Grass tufts can also be added to simulate sagebrush. Use the Seeding Grass and Weeds method (page 138) to add branches to the original tuft for a bush-like appearance. Accent the branchy tuft with the Wild Honey and Medium Green Static Grass Flock mixture. Using tufts is an excellent option to cover areas that are thickly covered in sagebrush.



CREATING REALISTIC VARIATION

Deserts require the smallest amount of variation to appear realistic. Most of the natural variation in desert areas is present in the soil and rock textures. Accent your soil ground cover with various colors for the most realism. Desert vegetation is sparse, so your model should have very few plants. Dead trees, stumps and logs are often signature looks in a desert, so add a few of those to vary the landscape.

Apply sagebrush in small, round clumps scattered over the terrain. Leave spaces between the plants where you can see some desert soil. For areas thickly covered in sagebrush, consider using Static Grass tufts. For more variety, use some brighter green or blooming sagebrush intermixed in the silvery varieties. When making sagebrush with Briar Patch, use different mixtures of Static Grass Flock for subtle variation in colors.

An oasis can provide some variation to an otherwise barren landscape. Oases provide an area of water that allows vibrant green vegetation to grow. They are also where larger animal life and human settlements can be found. Place large trees like cottonwoods, bushes, large sagebrush, brambles and grasses near water sources. Use Briar Patch, Fine-Leaf Foliage and Lichen to represent leafy vegetation around the waterline. Plant cacti and smaller sagebrush in dry areas farther away water sources.

WATER

Water makes up over 70% of Earth's surface, and it is a common feature on any layout. Bodies of water are found at the lowest point in a landscape's contours.

Rivers flow towards another body of water like an ocean, lake or another river. Many rivers, like the Missouri River, are naturally created when small rivers and creeks converge. Rivers in flat areas tend to be slow-moving, muddy (filled with sediment) and wind in braid-like patterns. Mountainous rivers are usually crystal clear and drop quickly in elevation, which creates wild rapids with white water and waterfalls.

Lakes can be natural or man-made. Glacial lakes, like those found in the Lake District in England, were carved when glaciers moved through the landscape. Many glacial lakes have large boulders left behind by the glaciers along the shorelines. Other lakes are created when people build dams to contain rivers and supply electricity to local towns and cities.

Each water feature is different and will need different products to achieve the desired results. Decide what kind of water feature you are going to create, such as a rushing river, quiet lake or ocean waves crashing on a beach. Then choose which products best fit your needs.

Product Overview

Realistic Water™

Use Realistic Water to model still or slow-moving water, such as ponds, rivers, lakes and more. This simple solution for modeling water can be poured directly from the bottle in layers up to 1/8" at a time.

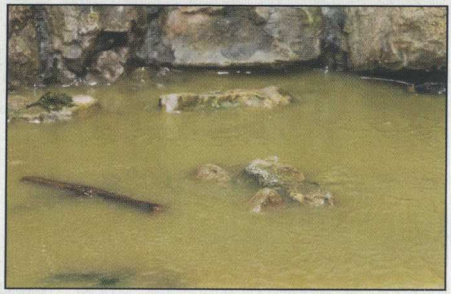
Realistic Water is self-leveling, water-soluble, won't crack and has minimal shrinkage. It is fully compatible with Water Undercoats™, Water Tints and Surface Waters. **NOTE:** Tuft-Tac glue is not compatible with Realistic Water.

Deep Pour Water™

Deep Pour Water can be poured in layers up to 1/2" at a time. It is ideal for deep water features and submerged underwater scenes. Deep Pour Water is available in pre-tinted Murky or Clear for customizing the color.

Deep Pour Water dries hard and won't crack, is non-shrinking and will not become discolored over time. It is fully compatible with Water Undercoats, Water Tints and Surface Waters.

CLEAR

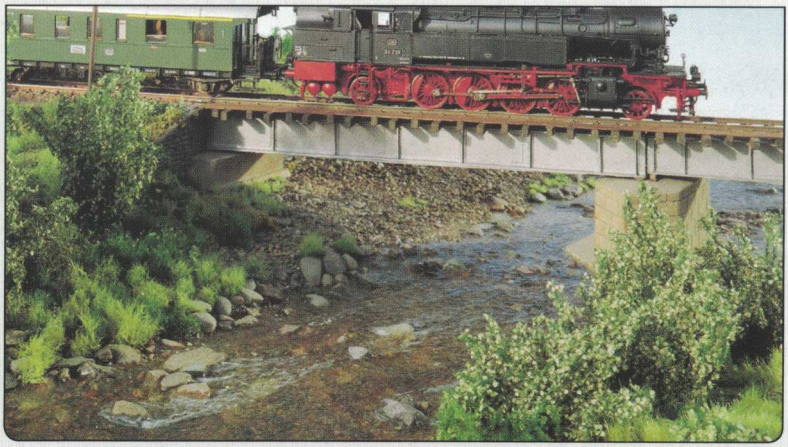


MURKY

E-Z Water™

E-Z Water is a great solution for easy, fast and flat surfaces. There is no need for measuring or mixing. Just melt E-Z Water and pour to create ponds, streams, rivers and harbors. E-Z Water hardens in minutes and is easy to tint with powdered fabric dye.

E-Z Water is a low odor, non-toxic, plastic product that comes in the form of pellets. It is compatible with Water Undercoats and Surface Waters. **Note:** Do not use Water Tints with E-Z Water.



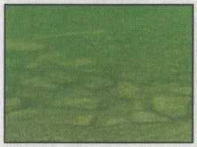
Water Tints

Water Tints make it easy to create natural shallows and depths. Use Water Tints with Deep Pour Water, Realistic Water or Surface Water for authentic colors on your water feature. Mix more than one to create custom colors.

NAVY BLUE

TURQUOISE

MOSS GREEN



SAGE GREEN

OLIVE DRAB

YELLOW SILT

MURKY

Water Undercoats™

Water Undercoats are 100% acrylic and available in six colors that color and seal your plaster base all at once. Combine multiple colors to create authentic transitions between shallows and depths.

DEEP BLUE

NAVY BLUE

HUNTER GREEN

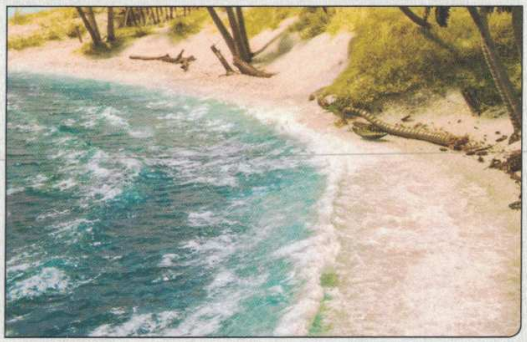
MOSS GREEN

OLIVE DRAB

YELLOW SILT

White Water Highlight™

Add White Water Highlight to intensify water crests, rapids and waterfalls. Create foamy or frothy water by adding White Water Highlight to Surface Waters or Deep Pour Water. White Water Highlight is 100% acrylic.



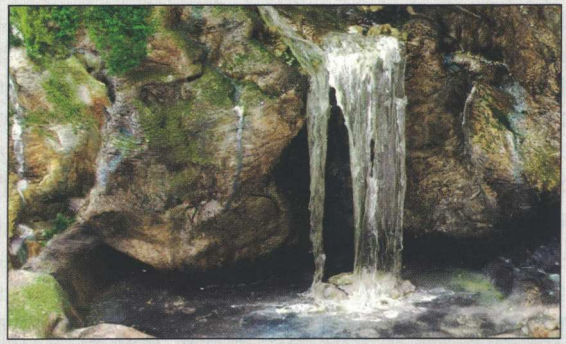
SURFACE WATERS

Set your water in motion by using Surface Waters to model splashes, waves and waterfalls.

Product Overview

Water Effects®

Water Effects is perfect for modeling fast-moving water features like waterfalls and rapids. Water Effects is moldable, holds its shape, dries clear, and remains flexible.



Water Ripples

Water Ripples goes on clear and dries clear to create ripples and windswept surfaces.

Water Waves

Water Waves goes on clear and dries clear to create splashes, waves and rapids.

PREPARING THE WATER CAVITY ONLINE VIDEO

The first step of any water feature is preparing the water cavity. Construct any banks or dams when you are forming the terrain contours with Plaster Cloth or Shaper Sheet (page 69). Make sure the banks of the water cavity will be deep enough to contain the water material.

All water cavities must be completely sealed by a smooth, continuous layer of Plaster Cloth, Shaper Sheet Plaster, Lightweight Hydrocal or Super Strength Plaster. Follow the water product's instructions closely to seal the water area with the appropriate material. This layer of plaster not only protects against seepage, but also creates a barrier between the water product and any materials used to create the layout base that may cause an adverse reaction with the water product. This step is essential to obtaining good results when constructing a water feature. After sealing the water area with plaster, you can also use a coat of Flex Paste to ensure any holes in the plaster are filled.

When installing Plaster Cloth, be sure to smooth all holes until they are filled. If they are not filled, add another layer of Plaster Cloth or a coat of plaster or Flex Paste to cover and seal the holes.

When modeling with Shaper Sheet, always coat the Shaper Sheet thoroughly with plaster. Do not pour a water product directly on the Shaper Sheet's fiber mesh.

Allow the plaster base of your water cavity to dry completely. Once dry, it is time to add color (page 175).

Coat Shaper Sheet thoroughly with Shaper Sheet Plaster.

COLORING THE WATER CAVITY ONLINE VIDEO

Natural bodies of water exist in a variety of colors. A lake or river may be dark and murky, while an ocean is bright blue. Colors also indicate depth, with deep areas often appearing much darker. Deep Pour Water, Realistic Water and E-Z Water are all transparent once they have cured, meaning you will be able to see the colors beneath them. Create these effects on your water feature by coloring the plaster base with Earth Colors Liquid Pigment or Water Undercoat prior to pouring the water product.

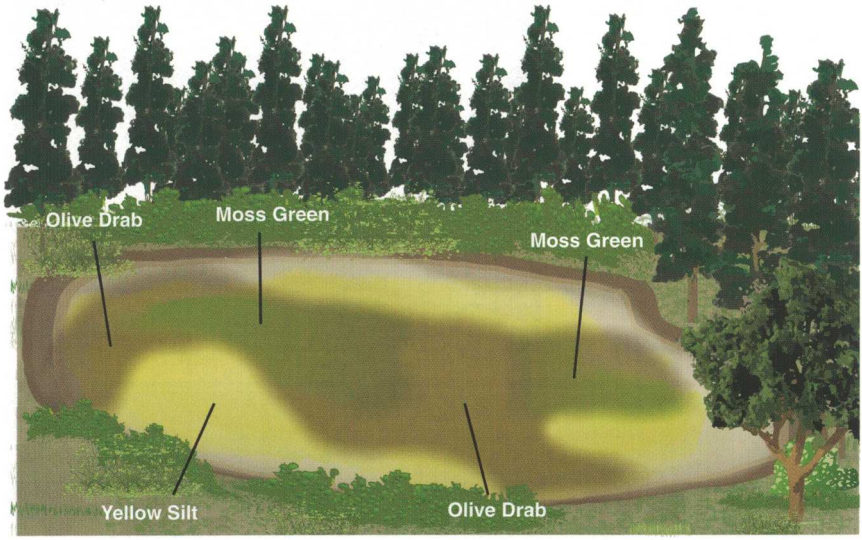
Adding Color

Most bodies of water range from turquoise blue and mossy green to murky brown. Earth Colors Liquid Pigment are all earth tones that can be used to create muddy creeks, rivers and ponds. Use Water Undercoats for water features that are shades of blue or green.

To apply Pigment and Water Undercoats, simply paint a couple coats on the water cavity. Use two or more coats for the best results. Make sure there are no holes in coverage and reapply if needed. Be sure your plaster base is sealed before pouring your water product (page 174).

You can create an illusion of depth with Water Undercoats or Earth Colors Liquid Pigment, reducing the need for a water feature that is physically deep. For most rivers, lakes, oceans and ponds, the shoreline is shallow and the depth increases the further you go from shore.

To create the illusion of depth, begin painting the deepest areas of your water feature with a darker color of Undercoat or Pigment, such as Deep Blue or Hunter Green. Paint lighter colors like Moss Green or Yellow Silt along the shoreline for the illusion of a shallow area. Blend the edges of the dark and light colors together to create a smooth transition between deep and shallow areas.



SEALING THE PLASTER BASE

Plaster is porous and can produce air bubbles in a water product. The plaster itself must be sealed prior to pouring. If you used Water Undercoats or 100% acrylic paint to color your water cavity, the plaster base will be sealed and ready for the water product. If you chose Earth Colors Liquid Pigments instead, you must seal your plaster base with a coat of Scenic Cement.

Allow the Scenic Cement, Water Undercoats or 100% acrylic paint to dry completely. Once the water cavity is colored and sealed, it is time to pour the water product. If you want to submerge items like Dead Fall, rocks, Talus, Turf, or figures in the water, skip to the "Underwater Features" section (pages 180-181).

CHOOSING A WATER

The type of water feature you create will determine which water product you should use. Consider factors like time, color, depth and other products you will be using. For example, slow moving creeks are not very deep and a product that is poured in thin layers, such as Realistic Water, may be the best option. On the other hand, a large lake will be much deeper and may require a product that can build up depth quickly, like Deep Pour Water or E-Z Water. Reference the product descriptions for pouring depth. Information such as curing time, whether a product can be layered, and the best techniques for each product is addressed throughout the Water section. We recommend reading the whole section before choosing a water product.

If you are unsure how much water product you will need, try the free Water Volume Estimator app at woodlandscenics.com. Simply enter the dimensions of your water feature, and the app will estimate how much Realistic Water or Deep Pour Water is needed for your project.

Water Volume Estimator
This fast and easy tool calculates how much Deep Pour Water or Realistic Water you need to create your water feature. Just put in the measurements of your water feature and let the Water Volume Estimator do the rest.

TINTING THE WATER ONLINE VIDEO

Natural bodies of water are rarely crystal clear and often become opaque as the depth increases. Materials suspended in water, like sediment, underwater plant life or pollutants, can affect the color of a natural body of water. These effects can be recreated by tinting the water. Tinting can adjust the transparency of the water to further the illusion of depth, soften details (like logs and rocks) underneath the water, create an algae effect and make the water look muddy or filled with sediment.

All water products can be tinted for different effects in the water feature, but tinting the water product must be done during the product's preparation. The products used to tint the water product vary depending on the product you choose.

Testing the Color

Like many natural water features, tinted water appears more opaque in deeper areas and remains more transparent in shallow areas. The more tint you add to the water product, the more opaque the water will be. If the water is too opaque, submerged details will be harder to see. Less is often best when it comes to tinting water features.

If you have a very specific look in mind, test the color in a cup of tap water. Use the Water Volume Estimator (page 176) to estimate how much water will be needed for your water feature and measure the same amount of tap water in a separate cup. Add the colorant to the tap water. Then pour this mixture into a dish approximately the same dimensions as your water feature to see how transparent it remains. Remember this color will also be impacted by the Water Undercoat color that you have on the plaster base. If it seems too opaque in the tap water, add less tint to the water product.

If the water feature is a critical pour on a finished layout, you may want to test the color on an actual water feature with the water product itself before committing it to a permanent layout. This is easy if you use Shaper Sheet. Create a similar-shaped water feature with a small piece of Shaper Sheet. Prepare it the same way as the permanent water feature and pour the tinted tap water into the Shaper Sheet model as a test.

Tinting Realistic Water

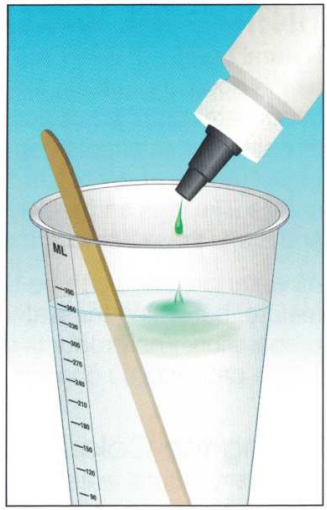
Realistic Water can be tinted with Water Tints, Earth Colors Liquid Pigment, 100% acrylic paint, food coloring and powdered fabric dye. To tint Realistic Water, pour the water product into a disposable cup. Add the chosen colorant to the water product and very slowly mix it into the Realistic Water. Slow, methodical mixing is the best way to prevent and reduce bubbles. If bubbles do occur, cover the cup and let the material sit until the bubbles disperse (approximately two hours).

You can add the colorant directly to the bottle of Realistic Water if you intend to pour a lot of water features in one day. If the colorant separates in the bottle, stir it again before use.

Tinting Deep Pour Water

The process of mixing, pouring and curing Deep Pour Water includes a chemical reaction. For this reason, the only colorants that should be used to tint Deep Pour Water are Woodland Scenics Water Tints.

Add Water Tint after stirring the Water Base and Activator for one minute. Mix the Water Tint with the Deep Pour Material thoroughly before pouring. Stir slowly to prevent bubbles. Bubbles that occur during the mixing process will likely dissipate during the curing process, but it is best to start with as few bubbles as possible.



MAKING A DAM FOR OPEN-ENDED WATER FEATURES ONLINE VIDEO

Large water features like oceans, harbors, bays and rivers can be difficult to model because of limited available space. However, you can create a water feature that abuts the edge of your layout, allowing you to create the water feature in the available space.

To make a water feature abutted to the edge of your layout, simply create a dam to hold the water product in. We recommend installing the dam before landscaping the water feature's base or banks. The Scenic Cement you use to install the landscaping materials on the base of your water feature will help prevent any leaks and ensure a good result.

For Deep Pour Water

When using Deep Pour Water, make a removable dam out of clear, smooth plastic. Cut the plastic taller than the desired depth of the finished water feature. Use Foam Tack Glue to attach the dam to the edge of the water feature. The glue must completely cover the seam between the layout and the plastic. Run a thick bead of glue along the edge of the water feature's base, and then press the plastic into it. If any holes are present, the Deep Pour Water will leak out of the water feature. Be thorough when applying the glue and installing the dam. Let the glue dry completely. If desired, run masking tape along the bottom edge of the dam to reinforce it and further prevent leaks.

Pour the Deep Pour Water (page 171) into the water feature, and let it cure completely. Once cured, gently peel the plastic away. If there is any excess glue stuck to the layout, scrape it off with a hobby knife. For a neat, crisp finish, paint the edges of your layout black all the way up to the open-ended water feature.

For Realistic Water

When using Realistic Water, the steps for creating and installing the dam are the same as Deep Pour Water except the dam will not be removable. Cut the plastic to snugly fit the water feature or trim the plastic after Realistic Water cures.

UNDERWATER FEATURES

When pouring a water product that is transparent, submerged objects will be clearly visible under the surface of the water. If the water has been tinted, the shape of the object will be visible but fine details may be obscured. Underwater features can include figures, boats, logs, rocks, sediment or plant life. Use landscaping materials like Talus, Dead Fall, Fine Turf or Static Grass in your underwater features.

Landscaping

Install landscaping materials directly on the colored water cavity with Scenic Glue, Static-Tac or Scenic Cement. Let the glue dry completely.

Landscaping materials are often porous and contain air that can cause bubbles in the water product as it escapes. Once installation glue is dry, saturate these items with Scenic Cement to seal them and prevent the air from escaping. Another way to seal the landscaping materials is to pour a very thin layer of Deep Pour Water over the water base. This layer will lock everything in place and allow air bubbles to escape during the curing process. Then pour an additional layer to the desired depth.

Figures and Accents

Figures and accents can be installed in a water cavity. Follow the instructions in the previous section to install figures. Testing in a small amount of water product is recommended before committing a figure to a permanent water feature. The paints used on figures and accents may not be compatible with the water product, and some accents may trap air, which will cause bubbles.

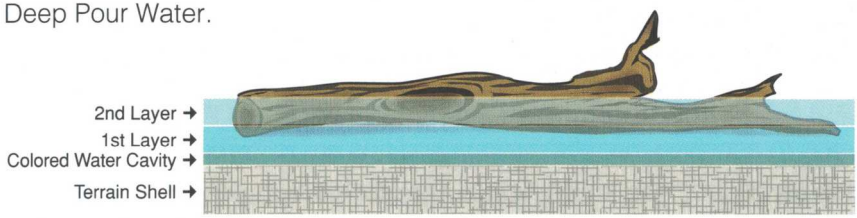
E-Z Water is not recommended for submerging figures and accents because E-Z Water is heated to very high temperatures that can cause plastic figures to melt.

Floating Objects

Draw attention to your water feature by creating the effect of swimming figures or floating underwater plants and debris. This effect is most pronounced when using Deep Pour Water but can also be done with Realistic Water.

To create this effect, pour the water product in at least two layers. The first layer will make it look like the object has water beneath it, while the top layer makes the object appear submerged. Prepare the water feature as described previously. Place the object on a non-stick surface and coat it thoroughly with Scenic Cement. Let it dry completely. While the object dries, pour the first layer of water product on your layout.

If you are using Deep Pour Water, press the object into the first layer of Deep Pour when it reaches the sticky state (approximately four hours after pouring). Then, pour another layer of Deep Pour over the object. To prevent bubbles, do not pour the water product directly on the object. If you miss the sticky state and the Deep Pour has hardened, secure the object to the first layer's surface with Scenic Glue, Static-Tac or Scenic Cement. Let the glue dry completely, and then pour the Deep Pour Water.



For Realistic Water, allow the first layer to dry completely. Then, attach the object to the fully cured first layer with one of the glues mentioned above. Allow the glue to dry, then pour another layer over the first. Avoid pouring directly on the object.

E-Z Water is not recommended for submerging items because it is not intended to be poured in layers. Transition lines between layers will be visible and the floating effect will not appear natural.

POURING THE WATER PRODUCT ONLINE VIDEO

Pouring the Water Product should be left to the very last stages of construction. Landscaping materials need to be installed and adhesives or latent moisture left over from the construction process should be dry. Lingering moisture in the layout can have adverse effects in all the water products, including cloudiness, inability to cure to a hard state and adverse chemical reactions.

The only landscaping materials you should install after pouring the water are trees and buildings surrounding the water feature. These items can physically get in the way when you are trying to pour the water product, so it is best to install them when the water has fully cured.

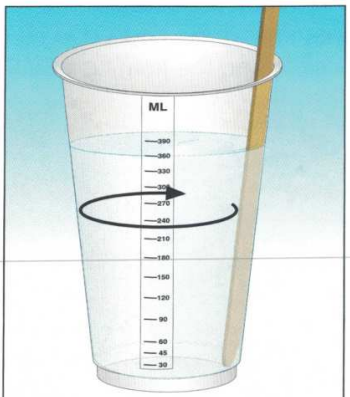
Each product is prepared and poured differently. Prepare your chosen water product by following all package instructions, as well as the tips and techniques below.

Deep Pour Water

Deep Pour Water is made up of two parts: the Activator and the Water Base. When mixed together, there is a chemical reaction that hardens and forms Deep Pour Water. Great results with Deep Pour Water are easy to achieve when instructions and tips are followed.

Preparation: Deep Pour Water is heat sensitive during the preparation and curing processes. It is important to warm the Activator and Water Base bottles before mixing. However, if the bottles are too hot to touch, they are too hot to pour. Let the bottles cool until they are warm to the touch, then pour into a cup. When you are stirring, scrape the sides and bottom of the cup to ensure the Water Base and Activator are thoroughly mixed.

Soak in warm water.



Scrape the sides and bottom of the cup when mixing.

Curing: Once poured, keep Deep Pour Water in an environment that stays an even, warm temperature. If the area it is curing in is below 75°, cover the pour with aluminum foil overnight. Cool air blowing across the water product during curing can cause a film to develop on the surface. If the environment is 75° or warmer, do not cover the Deep Pour with aluminum foil.

Bubbles: You may see trapped air being displaced, especially when there are submerged landscaping features. You can reduce the bubbles by misting the pour with rubbing alcohol. This will minimize the surface tension and allow the trapped bubbles to surface and dissipate. This will also help reduce capillary action: a natural phenomenon in which a liquid "creeps" up the sides of the container it is in.

Layering: You can pour Deep Pour Water in 1/2" incremental layers. Do not exceed a 1/2" depth in a single pour. For water features deeper than 1/2", pour the first layer up to the 1/2" depth, and let it cure to its sticky state (approximately four hours). Then, mix and pour the second layer. Repeat as needed to achieve desired depth.

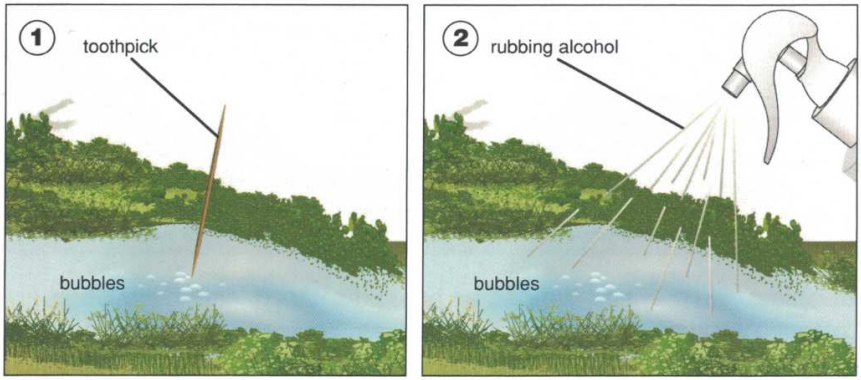
Adjusting Tint Intensity: After Deep Pour has been poured, you may see that the tint is too dark or too light. It is best to address any color issues immediately by mixing and pouring an additional small batch of Deep Pour that is either clear (for applications that came out too dark) or more opaque (for applications that came out too light). Do not exceed the 1/2" overall depth between the two pours. The second batch will blend with the first for an even, consistent color.

Changing Tint Color: If you pour a layer and want to change the color completely, you can. Mix and pour a second layer after the first has cured. The color will be cumulative, which means that if you pour Yellow Silt over cured Navy Blue tint, the overall result may be green. To block out the first color entirely, pour an opaque mixture for the second layer.

Realistic Water

Simply remove the cap on the Realistic Water bottle and pour the water product directly into the prepared water cavity. Do not shake the bottle at any time. Pour Realistic Water up to 1/8" thick—any deeper and it will remain cloudy rather than curing to a clear state. If bubbles are in the bottle, let it sit for two hours to dissipate. Realistic Water should cure to a clear state in about 24 hours, but it may take longer for deeper pours or humid environments.

If bubbles occur after Realistic Water is poured, **(1)** pop them with a toothpick or pull them to the edge of the water feature where they will dissipate quickly. **(2)** You can also mist the surface with rubbing alcohol to reduce bubbles and capillary action.



Before pouring Realistic Water, consider the following factors:

- Realistic Water is a hygroscopic material, which means it attracts water. If there is any latent moisture or if moisture is added after Realistic Water has been poured, this moisture can make Realistic Water cloudy. The cloudiness will dissipate over time, but you can stimulate dissipation by placing a fan in the room with the layout (do not aim fan directly at water feature).
- Realistic Water is not for use with PVA glues or Tuft-Tac and does not cure to a hard surface. Items placed on top will damage the surface and may permanently adhere.
- Do not store finished models with Realistic Water vertically.

E-Z Water

Melt E-Z Water pellets in a clean, dry, disposable metal container. E-Z Water is very difficult to remove if spilled and will not be easily removable from utensils or the container it is heated in. A tin can is a good option because it can be thrown directly in the trash. Use a disposable, non-melting utensil to gently stir E-Z Water during preparation. If you intend to pour a lot of E-Z water, dedicate a pan (Teflon) and utensil to the process.

Place the pellets in the container and use a burner or hot plate (only) to melt the pellets, following the instructions carefully. When the pellets begin to melt, stir gently. As soon as the pellets are liquified, pour E-Z Water into the prepared water cavity on the layout. Work quickly. The pellets are nearly colorless when melted, but they will darken slightly if continuously exposed to heat in a melted form for more than 15 minutes. Do not pour E-Z water in layers or transition lines will be visible. E-Z Water will harden in just a few minutes depending on how deep it is poured. If E-Z Water hardens before pouring, re-melt it in the pan.

SURFACE WATERS ONLINE VIDEO

Surface Waters are designed to create the illusion of motion. This can include anything from small ripples to waterfalls and ocean waves. The product you choose will depend on the motion you want to create for your water feature.

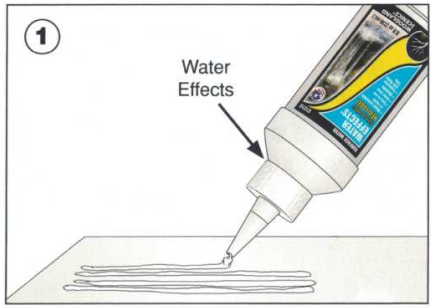
All Surface Water Products are compatible with Realistic Water, Deep Pour Water and E-Z Water. Surface Waters can be customized with Water Tints by mixing the Tint and Surface Water in a small disposable cup before application.

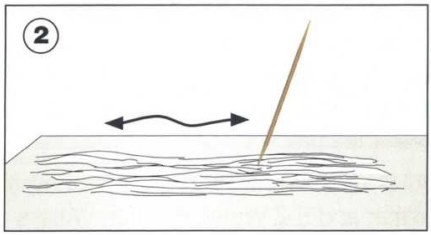
Avoid applying Surface Water where it will be in contact with submerged landscaping materials to prevent colorants in the landscaping materials from seeping into the Surface Water. If contact will be made, seal the object with Deep Pour Water prior to applying Surface Water.

Using Water Effects

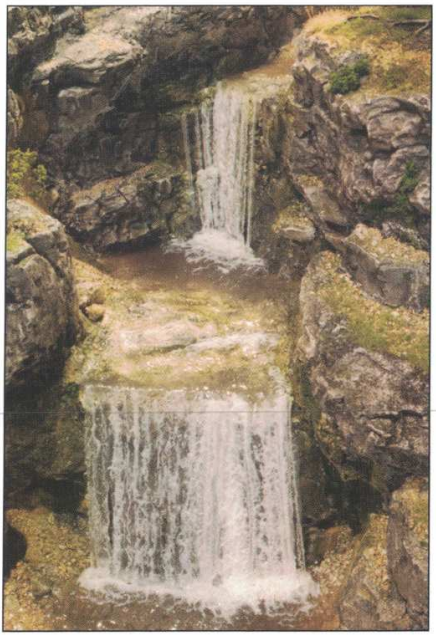
Model rapidly-moving water on your layout by squeezing strips of Water Effects on top of a cured water surface. Use a small brush to dab, or stipple, the Water Effects strips. Allow it to dry thoroughly.

To model waterfalls, **(1)** apply Water Effects to freezer paper in thin, wavy strips spaced tightly together. Measure the vertical drop on your layout, and make the waterfall 1/2" longer for attachment. **(2)** Use a toothpick to add texture or a damp paintbrush to smooth. **(3)** When dried clear, peel the waterfall off the freezer paper, and use a small amount of Water Effects on the bottom of each end of the waterfall. This will adhere the waterfall to the vertical drop on your layout. Hold in place until setting begins.





When modeling with Water Effects, keep in mind that the thicker it is, the longer it will take to dry. If you use a thick application, it can potentially remain a milky white for weeks. Less is more.



Using Water Ripples

When applying Water Ripples, you should consider what force is causing the water to ripple. If you are making a lake or pond, water will ripple from wind or activity like boats, swimmers, etc. Ripples are also frequently found where water is lapping against the shoreline. Whereas ripples on a river are caused by the flow of water around objects submerged in the water.

To model ripples, swelling waves or windswept water, dip a stiff brush into Water Ripples, loading it with product. Dab Water Ripples onto the surface of a cured water feature. Wait 10 minutes. You can let it dry as is, or you can make the ripples more choppy or soft. For choppier ripples, stipple the application again. For softer ripples, use a spray bottle to mist water or rubbing alcohol onto the surface while it is still wet. The more you apply, the softer the ripples will be. Wait another 10 minutes. Then let dry or repeat the above techniques until you reach the desired effect.

SMOOTH

GENTLE RIPPLES

HEAVY RIPPLES

NOTE: Water Ripples should always be applied directly to a cured water product. Do not apply directly to painted surfaces.

Using Water Waves

Large waves occur along beaches of oceans and on fast-moving rivers around or below submerged items. Tall, choppy waves can occur on large lakes due to wind, bad weather and boating traffic.

Use a craft stick to apply Water Waves directly to the cured water feature. Then dip another craft stick into water to wet it. With the wet craft stick, gently push the material into a peak. Form a cresting wave by pushing the tip of the peak over. Use a soft wet brush to smooth the surface of Water Waves. To create a choppy wave, use a toothpick to add detail. Apply Water Waves in 1" increments until the desired height is achieved.

For crashing waves on ocean shorelines, we recommend mixing Soft Flake Snow (page 190) and White Earth Colors Liquid Pigment into Water Waves. Add Snow and pigment until it is a thick texture. Then dab onto the shoreline, sculpting and shaping as described above.

HEAVY RAPIDS

A splash in a water feature can create a sense of time on your layout. To create a splash, shape Water Waves into smooth, circular waves around the epicenter. The epicenter is where the object creating the splash entered the water. If desired, you can

WAVES

install an object like a rock in the center of the splash as described in the Floating Objects section (page 181). The waves will become wider as they get farther away from the epicenter. To give the splash height, repeatedly layer dabs of Water Waves on top of each other until you achieve the desired effect. Let each dab dry completely before applying the next. It can take time to build up a splash, but it can be a very special feature on your layout.

NOTE: Water Waves should always be applied directly to a cured water product. Do not apply directly to painted surfaces.

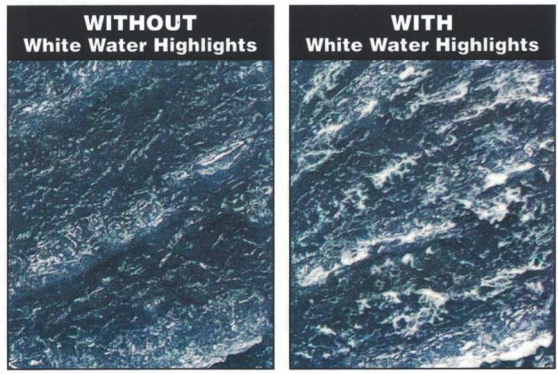
SPLASH

DETAILING WATER FEATURES

Still water can be crystal clear, but moving water often has some foam and froth. This is often found as whitecaps on waves, along a shoreline or where waterfalls meet a pool of water. The faster and more turbulent the movement, the more foam and froth there will be.

White Water Highlights

To create the appearance of froth, use the drybrush technique (page 112) and brush White Water Highlight on peaks of crashing waves. For detailed application, use a toothpick or damp, fine-tipped brush. For areas with a lot of crashing waves and heavy white water, like the base of a waterfall or around rocks in fast-moving rivers, load a larger brush up with product. Paint it on the area thickly, and then use the dry brush technique to create lighter white water areas around the churning water.



SNOW AND ICE

Snow and ice can be isolated to lonely mountaintops or spread across a winter wonderland. The setting of your diorama will determine if you should include snow. For example, if a diorama features the Northern Hemisphere during December, it will likely require snow. Cold and wintery details include everything from snowdrifts and icicles to frozen ponds and snow-covered trees. Look at pictures of snowy landscapes to see how snow falls on trees, buildings and other objects.

Product Overview

Flex Paste™

Flex Paste is a flexible, non-cracking modeling paste that can be applied in thin layers to prime foam or Plaster Cloth. It is also great for modeling winter features. Use with Soft Flake Snow to model heavy snow drifts.

Soft Flake Snow™

Use Soft Flake Snow to model a light dusting, heavy drifts or create ice on a water feature. Soft Flake Snow comes in a Canister Shaker for easy use and storage.

ADDING SNOW ONLINE VIDEO

Snowfall can be a thin dusting, covering only the topmost surfaces of objects or thick enough to completely cover large features. Roadways, sidewalks and patches of earth melt quickly, but snowfall can linger on vegetation.

There will usually be some earth or vegetation showing through any snowfall. For this reason, prepare your layout base as you would for any other scene. Form the contours and color the terrain shell and water cavity. Let any Earth Colors Liquid Pigment or Water Undercoat dry thoroughly before you begin creating a snow scene. Install all the trees and landscaping, as well. Do not pour water features until you are finished with the landscape.

Most vegetation does not have foliage during the cold winter months. In temperate regions, the only plant life that stays truly green during winter are evergreens and conifers. Other trees and bushes drop their foliage and grasses dry out to a straw color as they become dormant.

Once the terrain colors and landscaping materials are installed and the glue is dry, begin installing snow. Soft Flake Snow can be attached with Flex Paste or Scenic Cement. Flex Paste models snow well because it is a bright, snowy white and has enough body to create thick snow drifts. Flex Paste can be used on its own to add details to landscaping materials like trees and buildings. Scenic Cement allows modelers to apply snow over vegetation like Static Grass for realistic snow fields. Be sure to keep both Flex Paste and Scenic Cement on hand to create different effects.

Creating Snow with Flex Paste

Use a paintbrush or craft stick to apply Flex Paste to the terrain contours, but don't cover water cavities. These will be discussed in the Frozen Ponds, Lakes and Rivers section (page 193). Apply Flex Paste in thick layers for mounds of snow drifts. Otherwise, apply Flex Paste in thin layers that coat the ground. Be sure to dab Flex Paste on the tops of rocky ledges and any part that juts out from the rock face.

Once the terrain shell is coated with Flex Paste, you can sprinkle Soft Flake Snow over it on the terrain contours. This will create the light, airy look of snow while the Flex Paste creates the rounded edges of snow piles. Sprinkle until satisfied with the coverage.

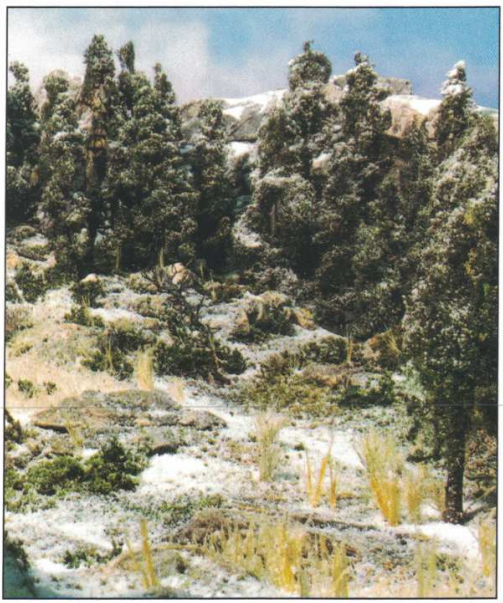
Next, add snow to landscape details. Dab snow on evergreen and conifer tree branches and needles to simulate snow piles commonly found on those trees. For deciduous trees that have dropped their leaves, paint thin strips of Flex Paste on the top side of the branches and around the bottom of the trunk. Dab Flex Paste on stumps, dead branchy bushes, etc. Apply Flex Paste on the roofs of buildings, exterior trim, pilasters and other areas where snow would build up. Sprinkle some Soft Flake Snow over the surfaces detailed with Flex Paste, if desired.

Dab Flex Paste on the branches of evergreen and conifer trees.

Paint Flex Paste onto the tops of deciduous tree branches and drifted against tree trunks.

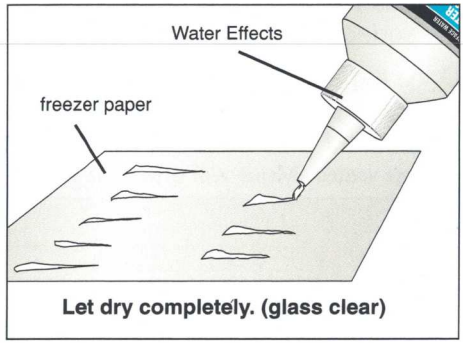
Applying Snow with Scenic Cement

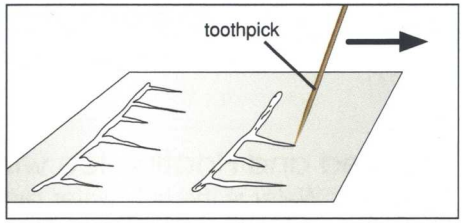
Applying Soft Flake Snow is just like applying turf. Simply mist the area with Scenic Cement and sprinkle on Soft Flake Snow. Spray again with Scenic Cement, if necessary, and repeat this process until you achieve the desired results. This method is ideal for creating snowy fields.



ICICLES

Icicles are an essential part of the winter landscape. They form along ledges, building trim, overhangs, tree limbs and any other surface where water can drip. Use Water Effects to create icicles. Apply thin strips of Water Effects to freezer paper, shaping them so one end is pointed and the other has a wider, blunt edge. To make a lot of icicles at once, squeeze one long line of Water Effects onto the freezer paper. Then, use a toothpick to pull the Water Effects down from the line into an icicle shape. Let the strips dry until clear and peel them from the freezer paper. Dab a small amount of Water Effects on the areas you want the icicles to hang. Attach the pre-made icicles to the small dab of Water Effects. Hold until the icicles hang in place on their own.





FROZEN PONDS, LAKES AND RIVERS

Frozen ponds, lakes and rivers are an essential part of every winter scene. The ice in these features ranges from crystal clear to completely white or a mixture between the two. There may be chunks of ice floating in the water or cracks in the ice along the shore. The surface tends to be textured, but it can be glass smooth.

Color your water base as described in the Coloring the Water Cavity section (page 174), and leave all water areas free of Flex Paste and Soft Flake Snow. Pour the water product after all other landscaping materials have been installed. Use Deep Pour Water or Realistic Water to model icy water features. The process will vary depending on the product you choose.

Ice with Deep Pour Water

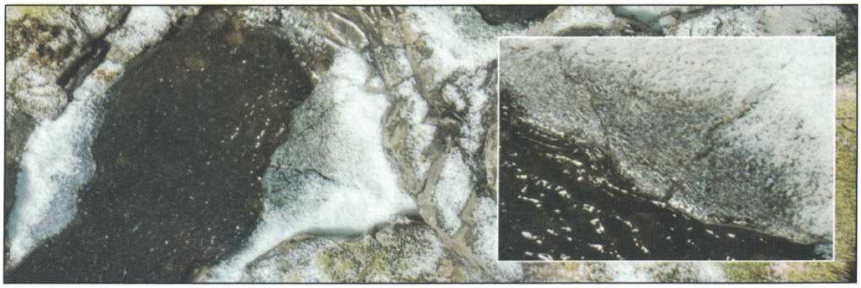
Mix and pour Deep Pour Water into the prepared water cavity as described in the Water section. Once it is poured, immediately begin sprinkling Soft Flake Snow into the Deep Pour Water. Cover the whole surface with Soft Flake Snow. Let it sink into the Deep Pour Water until the surface no longer looks snowy. It may take a few minutes.

Once the Soft Flake Snow has been immersed in the Deep Pour Water, you can add additional layers. Keep layering until you have achieved the desired effect. Less Soft Flake Snow will result in a glassy surface on the water. More will create a whitish, crystallized crust.

One layer of Soft Flake Snow.

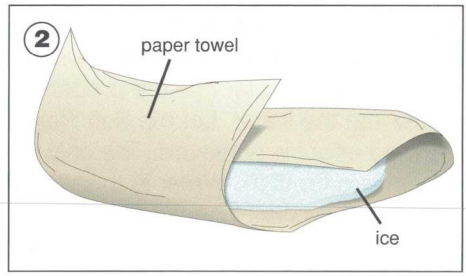
Cracked and Floating Ice with Deep Pour Water

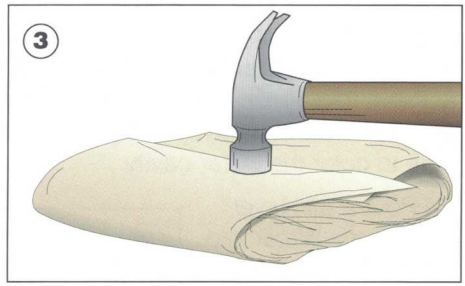
Deep Pour Water is the only water product that allows a modeler to make cracked or floating ice. To do this, mix a small batch of Deep Pour Clear. You won't need very much because you want it to form into a thin layer that can be easily cracked.

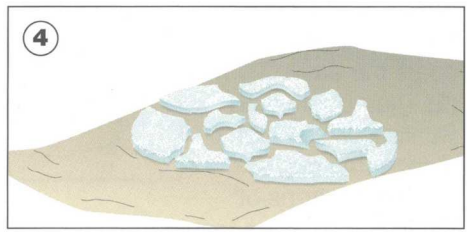


(1) Pour the Deep Pour onto a non-stick surface, such as the Plaster Cloth/Modeling Tray that is made of durable nonstick silicone, a sheet of polyethylene plastic, a non-stick pan or a cookie sheet covered in plastic cling wrap. If you are using cling-wrap, be sure there are no seams. Sprinkle Soft Flake Snow on the Deep Pour until the desired effect is achieved.

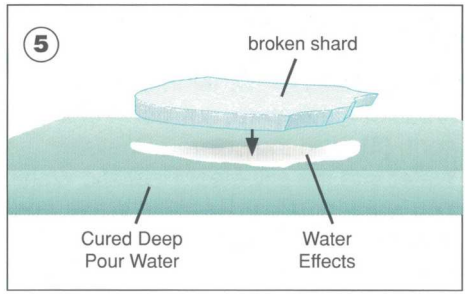
As the Deep Pour and Soft Flake Snow mixture cures, it will become more brittle and easier to crack. Let it cure a minimum of 24 hours. **(2)** Place it between a paper towel, folded towel or old rag. **(3 and 4)** Be sure the Deep Pour is completely covered, and then smash it with a hammer or mallet. If it does not crack the first time, try hitting it multiple times.



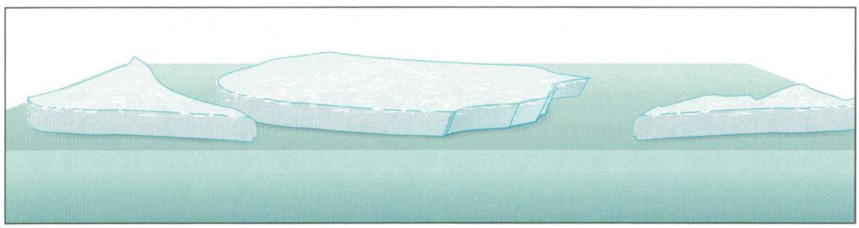




(5) Attach the broken shards onto a cured Deep Pour water feature using one of the Surface Waters as an adhesive. If you want to create the appearance of realistic cracks across the entire water feature, lay the shards on the surface of the water in the exact way that they cracked. This will create realistic crack lines.



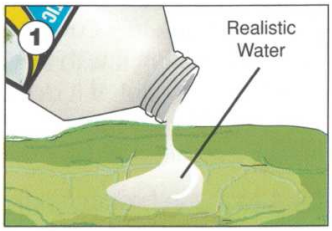
Once the Surface Water has dried completely, make another small batch of Deep Pour Clear and pour a thin layer on top of the lake. This will seal the spaces between the ice pieces and the top of the lake. Use a craft stick or toothpick to spread the pour if needed. Cover the cracks between the ice pieces and the lake, and allow it to cure completely. As a finishing touch, apply your choice of Surface Water to create ripples or waves around floating ice pieces.



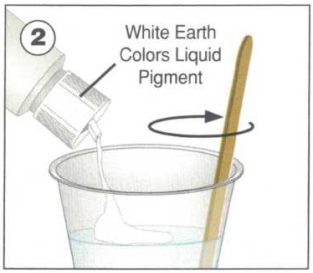
Ice with Realistic Water ONLINE VIDEO

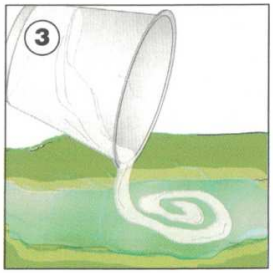
There are two ways to make ice with Realistic Water. For the first method, pour Realistic Water into the prepared water cavity and sprinkle Soft Flake Snow into the water. Let the Soft Flake Snow sink. Sprinkle more until the desired effect is achieved. The only difference between using Deep Pour Water and Realistic Water in this way is that you cannot make broken ice with Realistic Water because it does not cure hard enough to shatter.

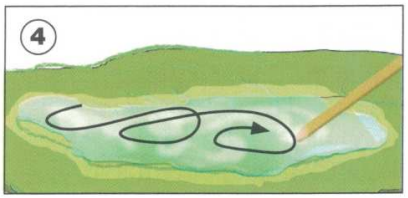
The second method for making ice with Realistic Water creates a smooth-surfaced water feature that looks frozen. Realistic Water must be poured in two stages to achieve this effect. This method will allow some of the water cavity to be visible, so be sure to color the water cavity.



(1) Pour a thin layer of Realistic Water into the prepared water cavity. Make this a thin pour that barely coats the cavity. **(2)** Then pour some Realistic Water into a disposable cup and add a few drops of White Earth Colors Liquid Pigment. Stir until the pigment is dispersed throughout the cup. **(3)** Pour the colored Realistic Water into different areas of the feature, not just in one spot. **(4)** Swirl the colored Realistic Water into the still-clear Realistic Water with a craft stick. Do not stir. You want the clear Realistic Water and the colored Realistic Water to be mixed, but also separate in some areas. This will create the swirled ice effect. Sprinkle a small amount of Soft Flake Snow into this mixture, if desired. Let the water feature cure completely.







Finishing Icy Features

Finish your icy water feature by cleaning up the banks. If you are creating a snowy scene with large snow drifts, cover the edges of the water feature with more Soft Flake Snow. If it is a melting scene, leave the banks edges slightly exposed to show that the snow and ice is beginning to melt.

When snow and ice melts, everything becomes wet. Paint a very thin layer of Realistic Water or Deep Pour Water over features like roads, sidewalks and rock faces that may look wet. Then use Water Effects to add figures like Ice Skaters to the surface of the feature. Water Effects dries clear and will be firm enough to hold the figures in place.

READY TO GO LANDSCAPE

Ready to Go Landscape is an easy way to quickly create a landscape. These products can be permanently attached to a layout, or you can take advantage of their portability for easy storage and transportation.

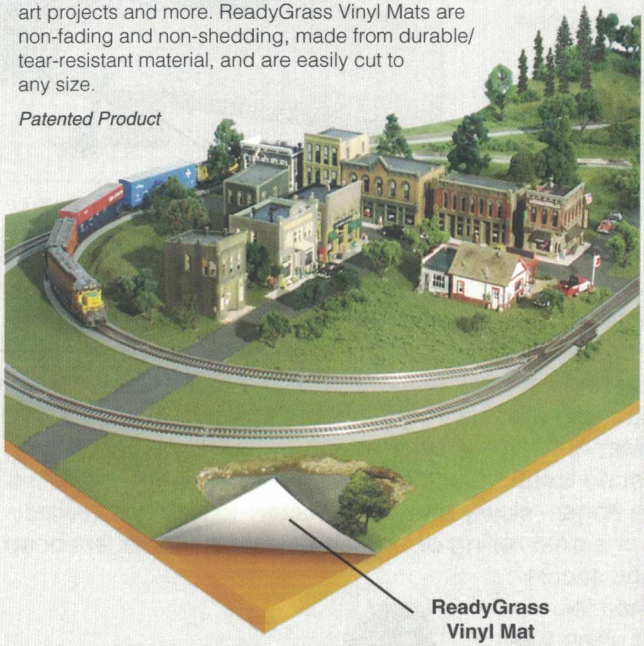
Product Overview

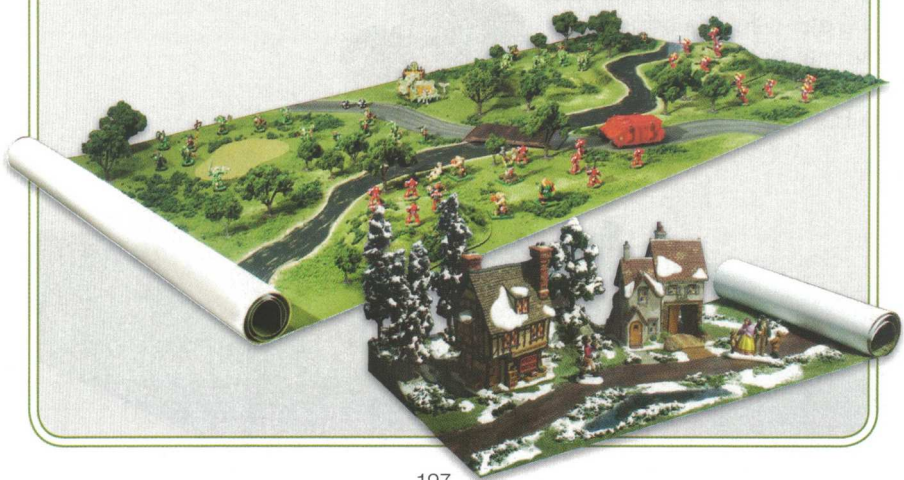
ReadyGrass® Vinyl Mat

ONLINE VIDEO

ReadyGrass Vinyl Mat is colorfast and is available in four sizes and five colors. They are great for train layouts, wargaming battle mats, military models, collectible houses, art projects and more. ReadyGrass Vinyl Mats are non-fading and non-shedding, made from durable/tear-resistant material, and are easily cut to any size.

Patented Product



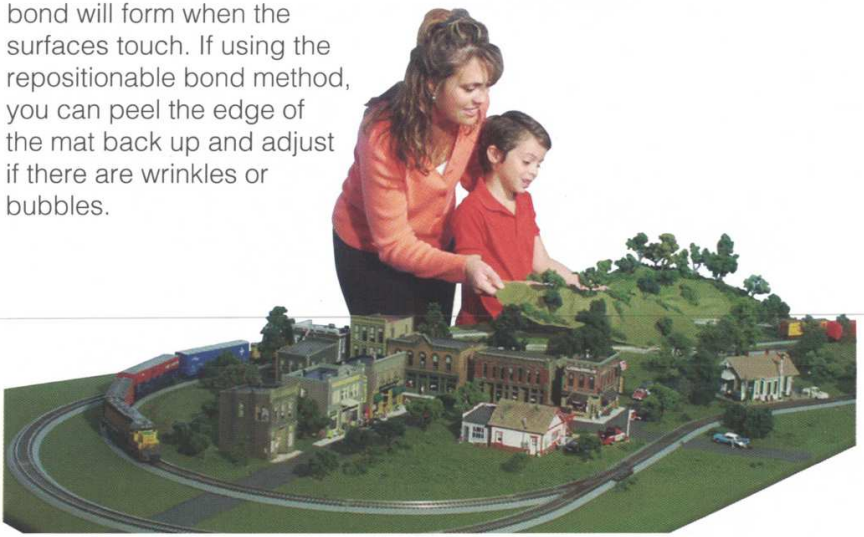


Installation

ReadyGrass Vinyl Mats can be rolled up, transported and used over and over, or they can be permanently installed on most flat surfaces. No preparation is needed for a portable mat. Just unroll the mat on a flat surface and place your project on top.

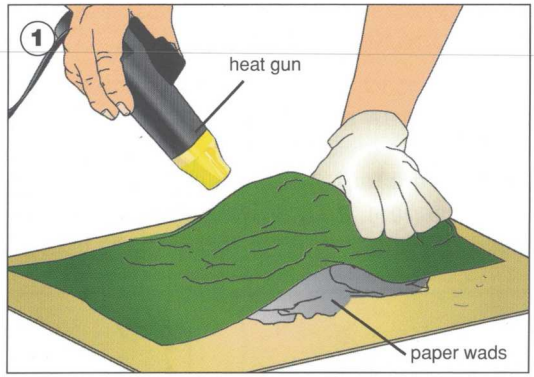
Follow the ReadyGrass Vinyl Mat Adhesive instructions to install ReadyGrass Vinyl Mats with either a repositionable or permanent bond. A repositionable bond allows you to adjust the Mat placement during installation and is recommended for modelers new to using ReadyGrass Vinyl Mats, as it can prevent irreversible errors like small wrinkles. A permanent bond is a fast way for experienced modelers to install a Mat and is recommended for smaller installation areas with less room for error.

For a repositionable bond, apply Mat Adhesive only on the installation surface. For a permanent bond, apply the Mat Adhesive on both the installation surface and the back of the Vinyl Mat. Let the Mat Adhesive dry until clear and tacky (no more than 2 hours; do not force dry with heat). When the Mat Adhesive is clear and tacky, align the Mat and lay it down in the desired location. Smooth the surface of the mat from the center toward the edges, slowly and methodically to reduce wrinkles, with a rolling pin or similar rolling device. If using the permanent bond method, an instant, secure bond will form when the surfaces touch. If using the repositionable bond method, you can peel the edge of the mat back up and adjust if there are wrinkles or bubbles.

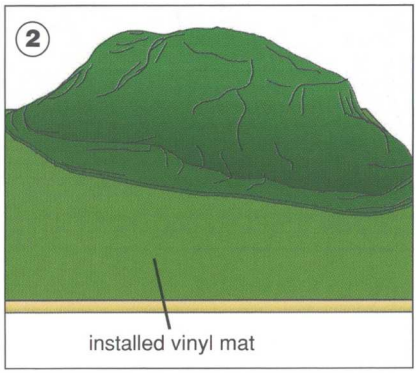


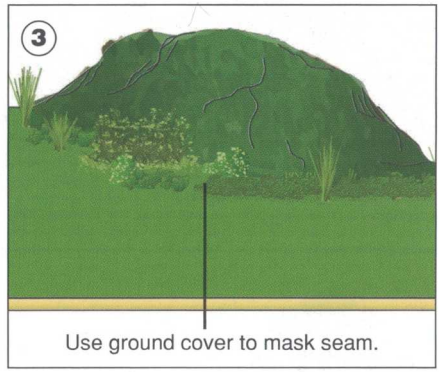
Terrain

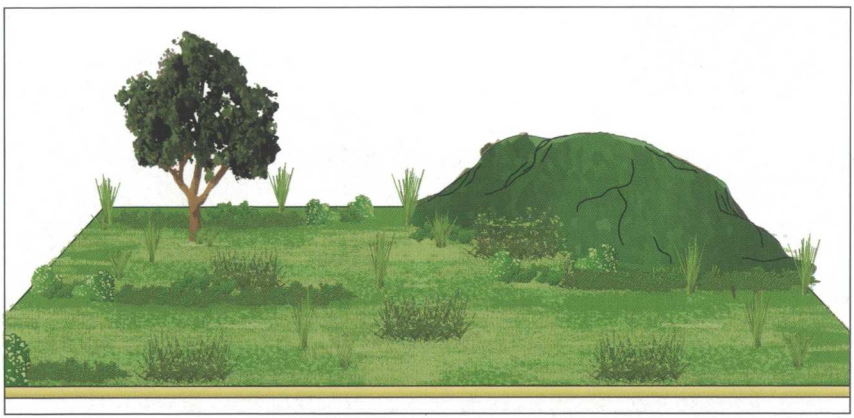
ReadyGrass Vinyl Mats are easy to landscape with hills, roads, water features and more. Place structures directly on the mat or use Ready Landforms for a quick hill or tunnel.



To create a hill or water cavity with ReadyGrass, create a contour shape with paper wads (page 66). Cut a piece of ReadyGrass Vinyl Mat that is larger than the area you want to cover, leaving enough excess material for installation. Lay the mat over the newspaper wads and use a heat gun (following all manufacturer instructions) to mold the Grass Mat over the wads. Remove the hill from the newspaper wads and trim around the base with scissors, leaving at least a 1" of excess for attaching to your layout.





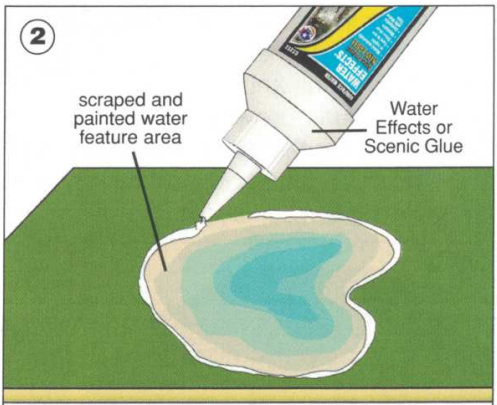


Landscape

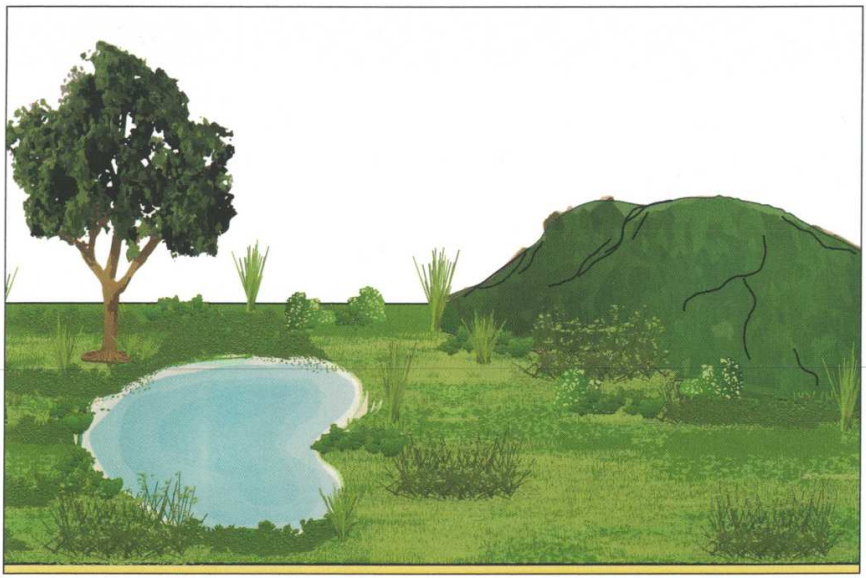
Vegetation and trees can be temporarily installed by simply placing vegetation on the layout and using the temporary bases for trees. Permanently attach vegetation like Bushes or Trees as described in the Vegetation section (page 123). For beginners, try the ReadyGrass Landscape Kit and Tree Kit.

To add a road, railroad tracks or water feature, remove the turf. Use a pencil to draw an outline of the feature, and then use a foam brush to wet the area inside the outline with water. Once wet, gently scrape the turf from the mat. Allow the area to dry thoroughly before landscaping. For beginners, try the ReadyGrass Road Kit or Water Kit to easily finish Road or Water areas, or follow these tips:

Scrape off turf for roads, water or railroad tracks.



Create barrier around water cavity.

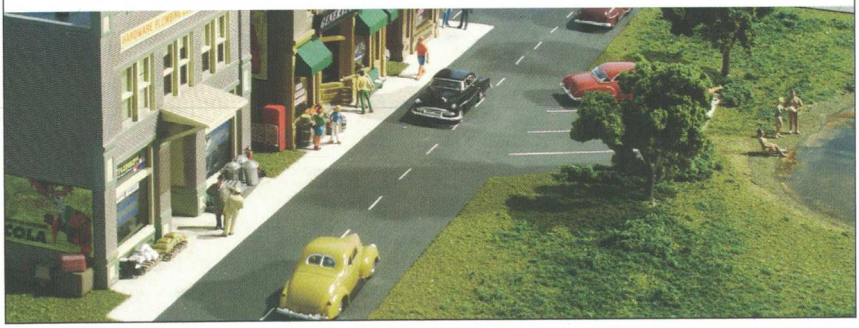


Track-Bed

For Track-Bed installation, lightly sand the scraped area with 120-grit sandpaper and attach Track-Bed as described in the Terrain Chapter (page 76).

Roads

For roads, paint the scraped area with Top Coat Asphalt or Concrete and stripe the road as described in the Roads section (page 93).



Water Features

For a water feature, paint the water cavity with a Water Undercoat. Let the Undercoat dry, and then pour Realistic Water as described in the Water section (page 184). Please note that ReadyGrass Vinyl Mats do not require a layer of Plaster Cloth or plaster to seal the water cavity. If you are using a flat Grass Mat, create a barrier with Scenic Glue or Water Effects to keep the water in the desired location.

NOTE: Do not use E-Z Water on ReadyGrass Vinyl Mats. E-Z Water's high temperature will distort the Grass Mat.

Product Overview

Ready Landforms™

Ready Landforms are ideal for model railroads, wargaming and traveling layouts. They are economical, mess-free and ready to set in place. Ready Landforms are available in two styles—Tunnels and Rocky Ridges. Tunnels are available for N and HO scale. There are molded-in portals at each end and the Tunnels are straight or curved. Rocky Ridges are available in two sizes and are perfect for rocky embankments and hills.

Tunnels and Rocky Ridges complement ReadyGrass Vinyl Mats, blend with any layout and work for any number of projects.

STRAIGHT TUNNEL

CURVED TUNNEL

ROCKY RIDGE LARGE

ROCKY RIDGE SMALL

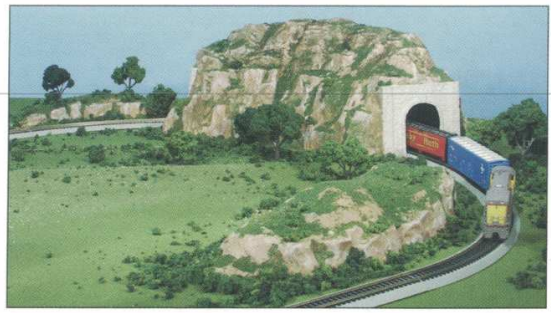
Installation

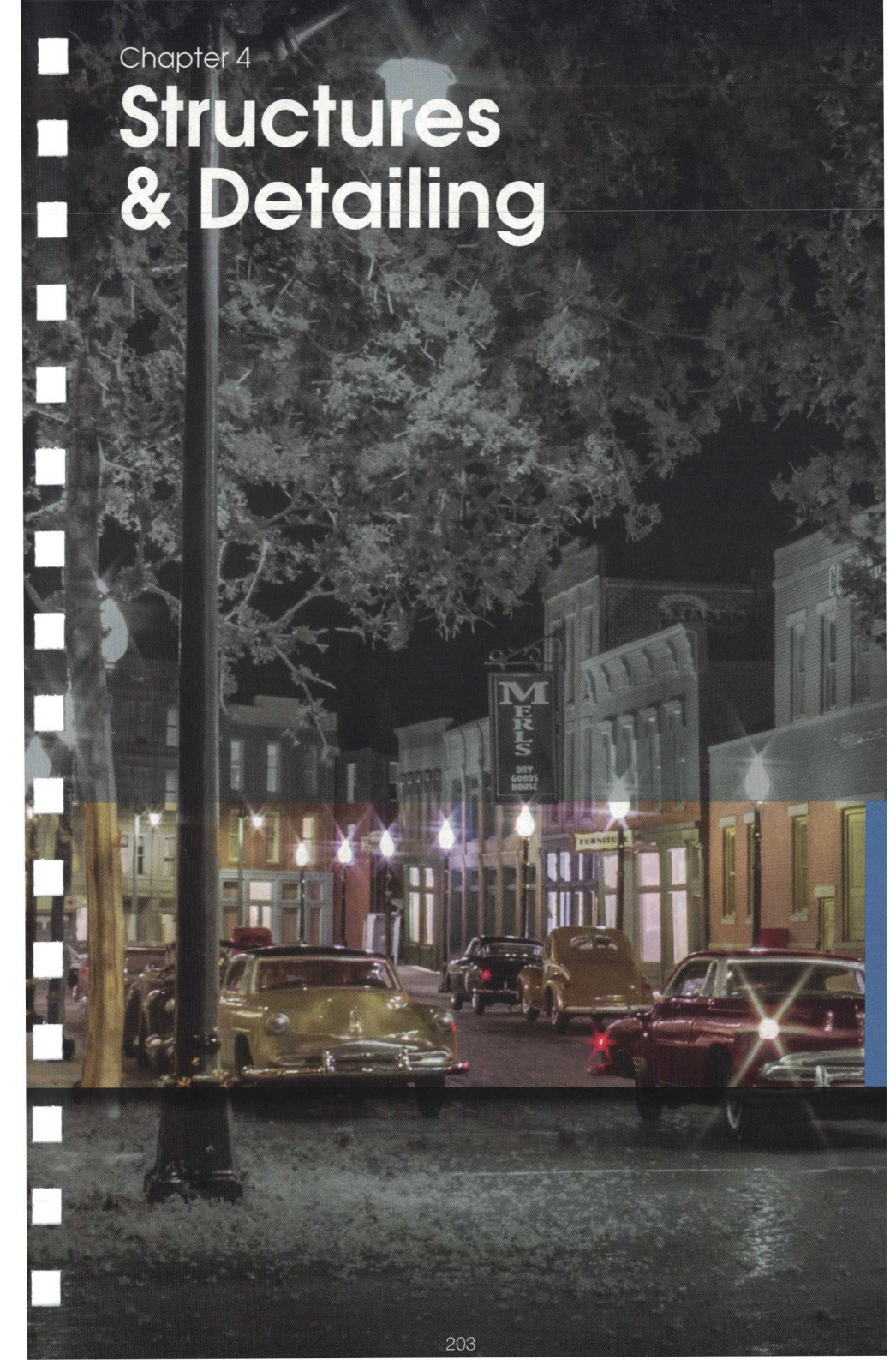
For temporary installation, simply place the Landform in the desired location. For a permanent installation, attach the Landform with Scenic Glue or Foam Tack Glue. Use vegetation to hide the seams between the layout and Landform (page 123).

Landscaping

Ready Landforms come with landscaping pre-installed, but you can add additional scenery to customize the landform for your layout.

To landscape the Ready Landform with low undergrowth like Fine Turf or Coarse Turf, use Scenic Cement or Scenic Glue. Attach foliage materials like Bushes, Underbrush or Clump-Foliage to the shell where desired using Scenic Glue. To add trees, poke a hole through the shell using a Foam Nail or any sharp object and plant as described in the Trees Section (pages 144-151).

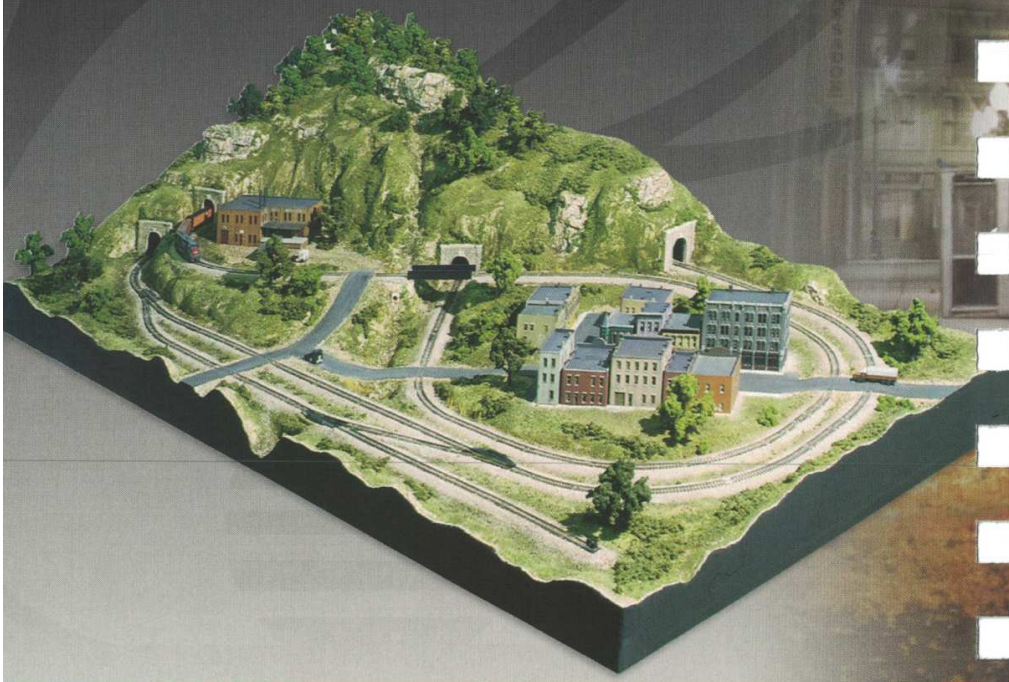


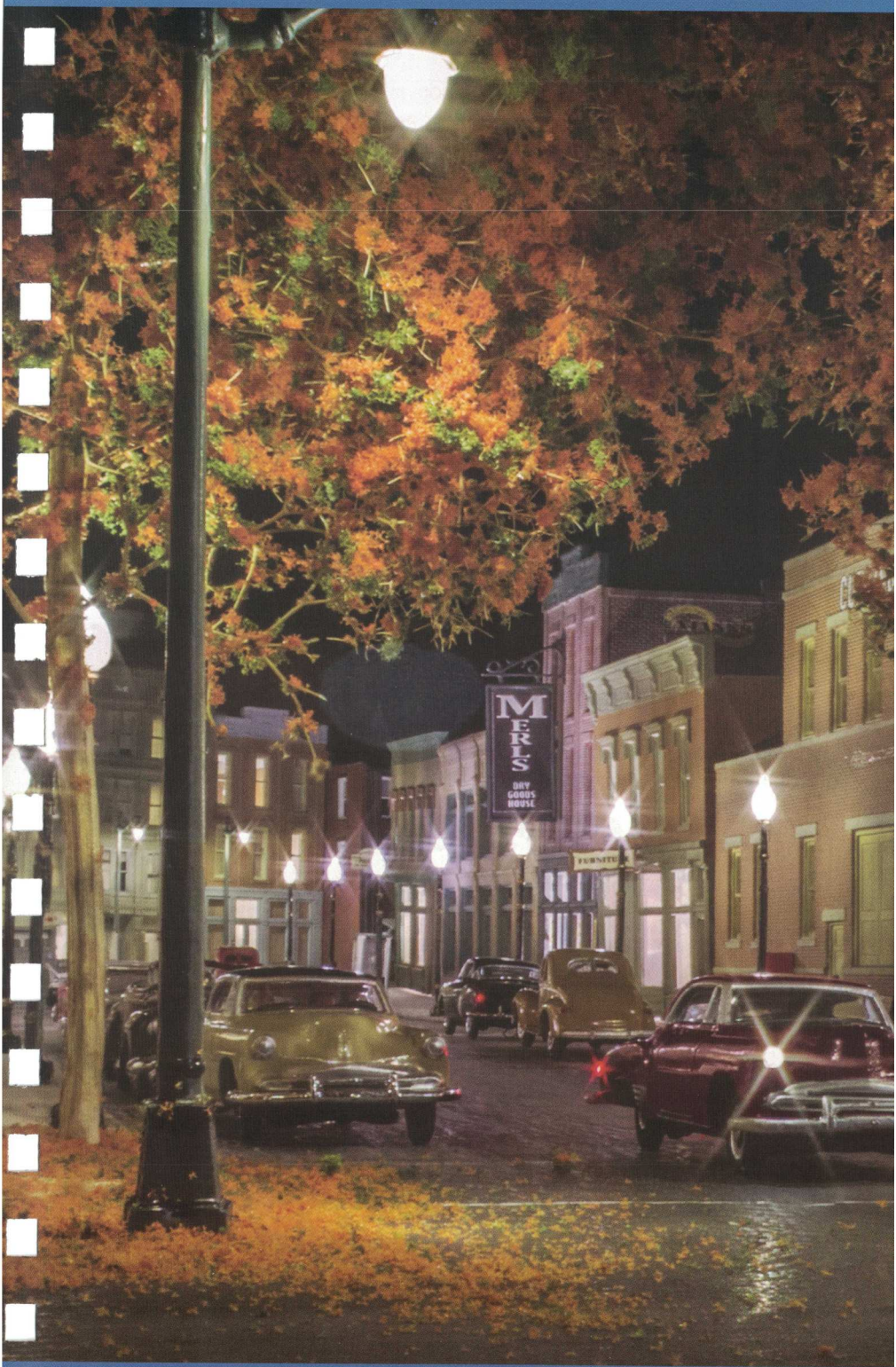

Chapter 4
Structures
& Detailing
MERL'S
DRY-
GOODS
HOUSE

Now that the landscaping is finished, you can enhance your layout with structures, lighting and other details. Refer back to your layout plan to decide what you should add to take the realism of your layout to the next level. When selecting details like structures, consider the time era your model is set in. Should people be walking in the town center? These are the details that tell the layout's story and give a real-life quality to your model.

Structures are an easy way to add character and include everything from a windmill on a farm to an office building in the city. Adding lights to your structures will create a sense of life and activity. With the Just Plug Lighting System, you can add lights without complicated wiring or electrical know-how.

Other details, such as weathering or decals, are also introduced in this chapter. Products will be mentioned before you learn about the processes. Read through the entire chapter before altering any features for your layout.




MERL'S
DRY
GOODS
HOUSE

STRUCTURES

Structures are an easy way to add dimension, realism and character to your layout. They are available in a variety of shapes, sizes, scales and styles. You can customize them with paint, lights, weathering or landscape.

Consider the setting when choosing your structures. Some structures are designed for farm scenes, while others are better suited in a city. A wargamer may want fantasy or post-apocalyptic structures, while a model railroader might prefer structures for a 1940's New England scene. The setting you choose will impact the styles of structures that work for your layout.

After choosing the style, decide if you prefer pre-made structures or if you would rather make your own. Pre-made structures are great because you only need to install them on your layout, but making your own may be necessary for unique or specific structures.

If you are unsure about placement or how multiple structures will fit closely together, try making paper replicas with the same dimensions of the structures you plan to include. These paper replicas can be moved around the layout easily to verify the location and fit.

LANDMARK STRUCTURES®

Landmark Structures are a complete spectrum of architecturally accurate buildings in N, HO and O scale. Enjoy the ease of using a building that is already built and weathered with expert detail, or build your own structure to fit your layout's needs.

Product Overview

Built-&-Ready®

Built-&-Ready structures are ready to be placed on your layout straight out of the package. Each one is highly detailed, architecturally accurate, expertly painted and realistically weathered. Depending on the structure, extra details may include lights, accessories, window treatments, decals and printed interiors.

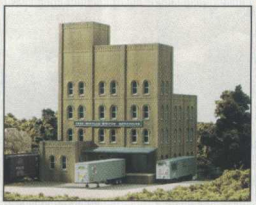
ONLINE VIDEO

Building Kits

Building Kits include all the necessary pieces for making a specific building. They are easy to assemble and allow you the creative freedom to paint, weather and detail as you wish. Building Kits are available in a wide variety of building styles and assembly types. The most basic kits include walls and roofing material, while others have loads of scene-setting details, decals and accessories.

Modular Buildings

Modular pieces are a great option if you want a specific building that is otherwise unavailable. Build anything from a corner gas station to a multi-story office or manufacturing complex. Modular parts offer unlimited building options. Interchangeable wall sections make it easy to build a structure of any size, shape and height.



Scene Kits

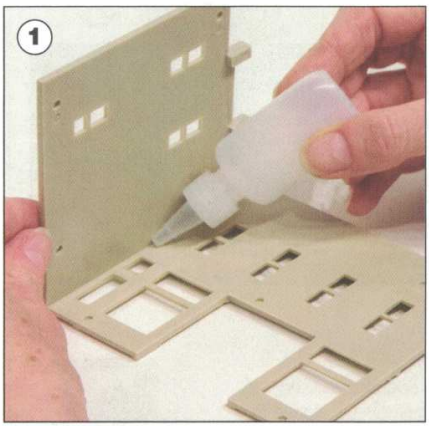
There are four types of scene kits: Mini-Scene® Kits and Scenic Details®. Scene Kits contain landscaping materials or lead-free metal castings that can be finished with the Pewter Patina Finish or Mini-Scene Paint set.

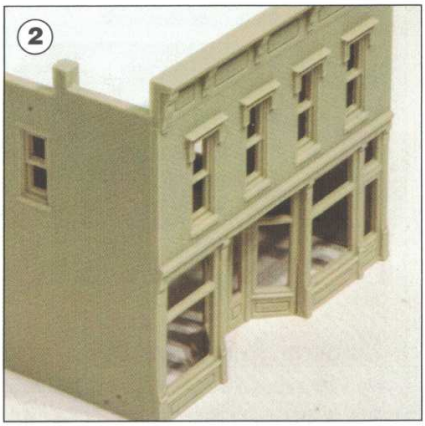
Each scene represents a snapshot of activity. Some kits show typical scenes from everyday life. Others are more humorous like the Mini-Scene Outhouse Mischief.

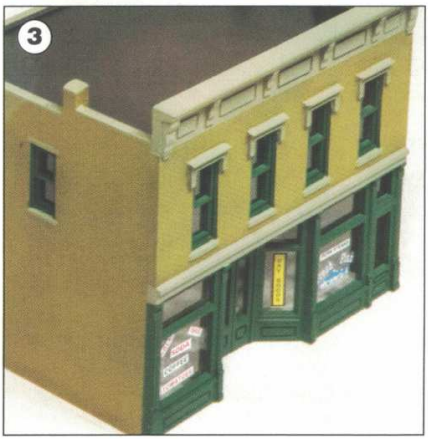
Scene Kits are designed for HO Scale. Display the scene kits in the Glass Dome or on your layout. You can also use them to practice new techniques before working on a permanent layout.

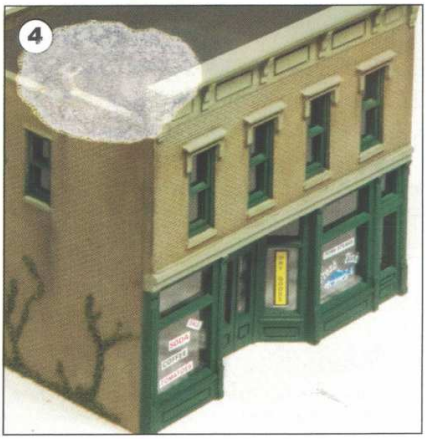
ASSEMBLING AND PAINTING KIT STRUCTURES ONLINE VIDEO

Building assembly instructions will vary from kit to kit, but there are some general principles that apply to all Building Kit structures that will help you achieve the best results.







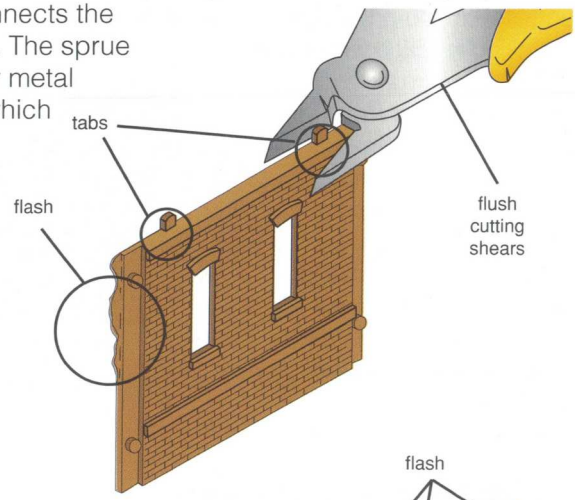


WASHING PARTS

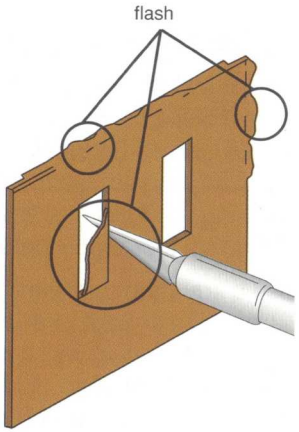
Each piece is molded, and there can be some lingering mold release agent on the piece. This can prevent adhesive and paint from adhering to the pieces. Before you begin, wash all parts by hand in warm soapy water with a mild detergent. Washing the parts thoroughly will remove the residue. Then rinse and let them dry. All metal and plastic castings should be washed before painting.

REMOVE TABS AND FLASH

Use a hobby knife, flush cutting shears and sandpaper to remove tabs and flash from the parts. In manufacturing, a **tab** is the small piece of plastic or metal that connects the molded part to a **sprue**. The sprue is the piece of plastic or metal that connects to tabs, which hold the small molded parts together. **Flash** is a thin edge of excess plastic or metal that leaks from the seam between the top and bottom of the mold during the casting process.

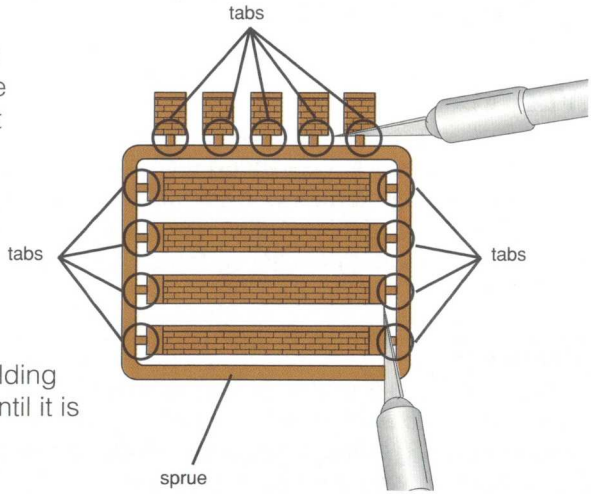


To remove tabs: If using a hobby knife, score the tab at the joint that is flush with the part. Snap off tab and sand edge smooth. If using flush cutting shears, remove as shown.



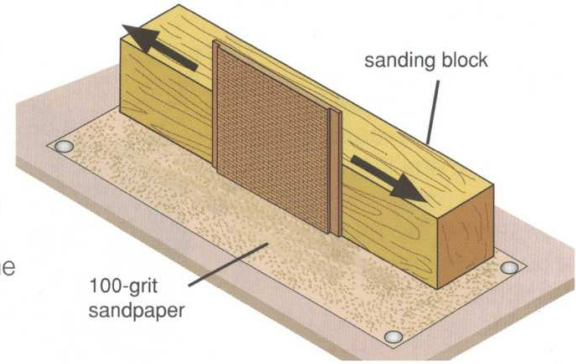
To remove flash: Lightly scrape along edges to remove flash debris. Use the dull edge of a hobby knife blade to scrape the flash. Keep the cutting edge facing away from the edge you are scraping to prevent cutting into the part. Sand the scraped edge smooth.

To remove the part from a sprue: Score the connection point flush with the part using a hobby knife. Snap it off. Then sand any parting lines and mold flash that still remains. Always keep the building parts on the sprue until it is ready to use.



PREPARE WALLS

Due to the molding process, some walls have beveled edges. Beveled edges need to be removed for walls to sit flush and square. Sand beveled edges with 100-grit sandpaper. Each kit comes with individual instructions that specify which wall edges to sand. Do NOT sand edges that have detailed brickwork, unless specified. To avoid rounded edges, sand the wall on a flat surface and apply even pressure. You can also thumbtack sandpaper to a flat surface and use a "squaring block." Hold the squaring block in place while sanding walls.



HOW TO ATTACH PARTS

Use plastic cement or cyanoacrylate adhesive (CA glue/super glue) to glue parts. Plastic cement works by dissolving the surface of plastic and welding parts together. Be careful to avoid contact with detail on parts and visible areas on window treatments. Cyanoacrylate adhesive is recommended for installing windows and small parts due to its quick dry time. Always allow glue to set thoroughly before moving on to the next construction step.

Use a squaring tool when assembling wall sections. You can use a carpenter's square or a firm piece of styrene that has 90 degree angle corners. Align two wall sections against the square until the sections create a corner. Dab glue along the corner joint and hold firmly in place until glue has set and hardened. Once this corner is established, attaching the other wall sections will be much easier.

LEVELING

After the building is assembled and glue is completely dry, the bottom of the building needs to be sanded until it is level. To level, thumbtack a piece of 120-grit sandpaper to a flat surface. Carefully sand the bottom of the building in a circular motion until the bottom edges are even and the building sits plumb on a flat surface. Do not sand into brick detailing.

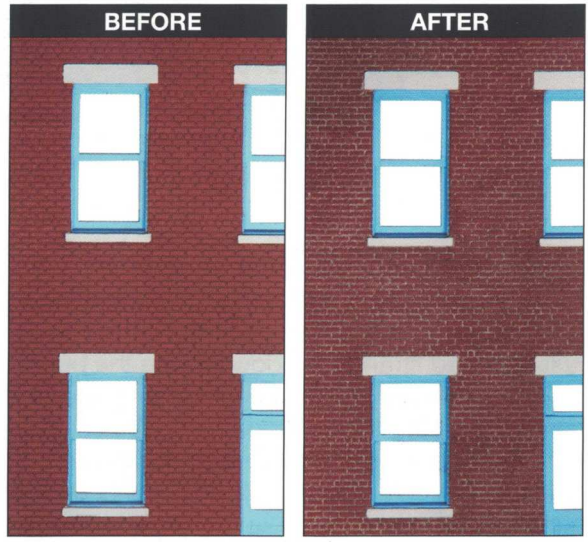
PAINTING

You can customize any structure simply by painting it. The three rules you must follow to achieve a great paint job are: consider what kind of glue you are using, always install the window material after the paint is dry and do what is best for your work flow.

When you paint your building is up to you, but most kit instructions suggest painting after assembly to reduce touch-up painting and guarantee the glue works properly. Some glues, like solvent-based plastic cement, are incompatible with paint and will dissolve and/or bubble the paint job. We recommend using cyanoacrylate adhesive, so you can paint at any time. If you paint before assembly, scrape paint from the glue joints to ensure the adhesive bonds well with the building parts.

Choose paints that have a flat, matte finish. Semi-gloss and glossy paints leave a shiny finish that is not very realistic. The building kit instructions include whether you should use enamel, acrylic or solvent based paint for a specific structure. Check instructions before purchasing paints.

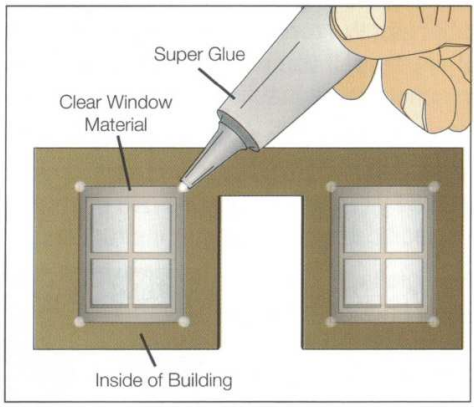
A single layer of paint is not enough to keep the building materials from showing through and will result in a patchy appearance, while too much paint can cause the realistic detailing to disappear. Start by painting the structure with a layer of flat gray primer paint to prevent a patchy appearance and ensure the molded-in details are not lost. Then paint as desired.



There are three general painting methods: airbrush, aerosol and hand-painting. Regardless of the method, start by painting the whole structure one color. Let it dry completely before adding accent colors to highlight textures like mortar in brickwork and wood grain. For wood grain texture, use the drybrush technique to paint the building (see page 213). Each kit structure will have molded-in wood, brick or stone textures on the building parts. The colors you choose should be compatible with the structure and scene.

INSTALL WINDOW PANES

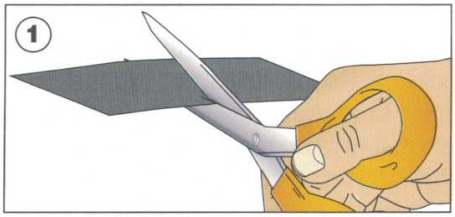
Once your building is painted, it is time to install the window material. Each building kit comes with Clear Window Material to replicate glass window panes. Cut the Clear Window Material to fit over the windows, allowing some overlap. If the windows are grouped together, you can cut it so it covers all of them at once. Center the Clear Window Material over the windows on the inside of the building and carefully dab a small amount of glue around edges. Repeat for each set of window openings.

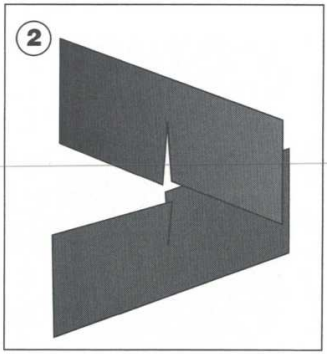


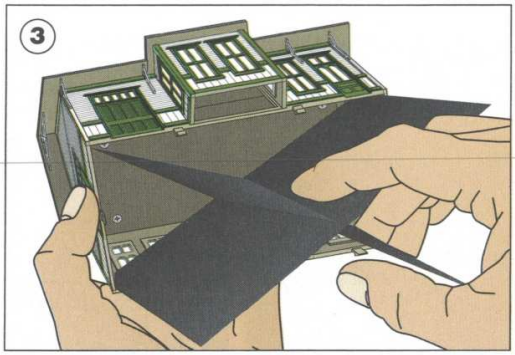
FINISHING TOUCHES

If your building does not have an interior, a viewer will be able to look in the windows and see the unpainted plastic walls. The windows will also cast light and strange shadows inside the building. You can fix this by cutting two strips of black construction paper and notching them in the center. Place them diagonally so the cut marks meet and an X is formed. Slide the pieces together at the notch and install them in the building. This will block light from the windows and cover up unsightly interior walls.

This finishing technique is great if you do not intend to light the structure. Adding lighting to a building makes it look occupied. See page 226 to add lighting to your structure.





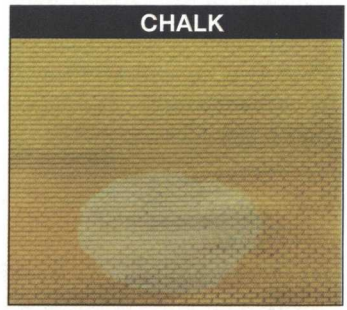


WEATHERING STRUCTURES

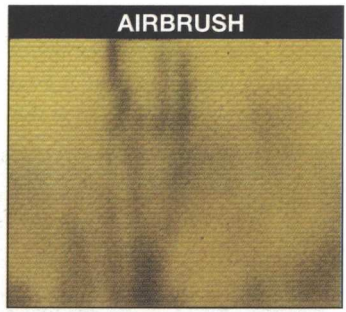
Any surface that is exposed to the natural elements, such as rain, wind and dust, is likely to have some kind of discoloration called weathering. Building occupants and wildlife also add wear and tear to structures. In modeling, weathering adds a sense of time and place, which helps create realism.

The amount of weathering present on a structure will depend on environment, age and how well it has been maintained. For example, industrial buildings, like a coaling facility, will often have residue buildup all over. While a new house will look crisp and fresh, a poorly kept, old house will have peeling paint and grime. Keep these factors in mind when determining how much and where to weather your structure.

Weathering a structure is an easy process, typically done with a mixture of materials. You can use acrylic paint, chalk and/or Fine Turf to weather your structures. Use diluted acrylic paint or chalk to create the look of grime, mold and stains. Paint will create a darker, more intense weathering than chalk. Use Fine Turf to replicate moss, pollen, dust and debris.



To weather with paint, dilute the paint so it is a light wash and dab it over the building. Let the wash seep into any cracks and crevices where the grime buildup would be the most intense. To weather with chalk, rub the chalk on sandpaper to create chalk dust. Then apply the chalk dust using the drybrush technique (page 112). Apply Fine Turf using the flyspeck technique (page 133).



For realistic weathering, choose colors that contrast enough with the building's paint to show subtle wear and tear. Add scratches to surfaces before you apply any weathering. The materials will fill the scratches to make them look worn. Test your weathering material's colors on inconspicuous areas or on sample swatches of paint before you begin.

INSTALLING STRUCTURES

Buildings need a flat building site to sit evenly on a layout. Either plan in advance and keep part of your layout flat for buildings, or cut into the terrain shell to create a flat surface before installing your building. Regardless of whether you install the building temporarily or permanently, always use some ground cover to mask the seams between the building and terrain shell after installation.

If your building has or will have lights, be sure to see Installing LEDs (page 226) before installing structures on your layout.

TEMPORARY INSTALLATION

Temporary installation of a structure allows for the model to be updated at a future date. It is great for modelers who want to continuously improve their layout or if you are unsure where the building's permanent foundation will be.

To temporarily install the building, simply place it on the flat building site or use some Ribbon Putty from the Light Block Kit (page 224) to hold it in place. Stretch the Ribbon Putty along the bottom edge of the building and press it into place on your layout. When you need to move the building, simply peel it up from the terrain shell. This putty doubles as a light block to prevent light bleed when you add lights to your building.

PERMANENT INSTALLATION

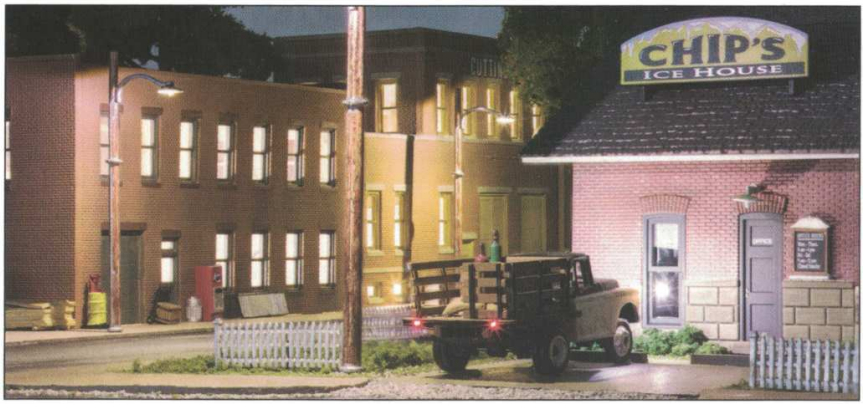
Permanent installation is best when you know the model you are making will not need to be updated and when you want to prevent other people from bumping the building out of place. To permanently install a building, run a bead of Foam Tack Glue along the building's bottom edge and place it on the flat building site on your layout.

LIGHTING

Day or night, lights are a sign of activity and life in homes, offices, shopping malls and more. Adding lights can make a big difference on a layout by adding interest and realism.

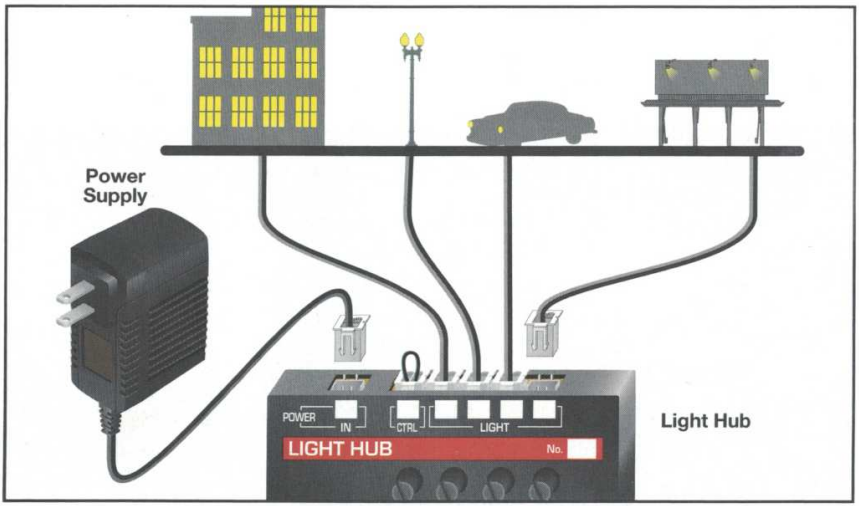
For years, the only way to add lights to a layout was with electrical knowledge, complicated wiring and expensive tools. Not everyone is an electrician or has time to learn these skills. The Just Plug® Lighting System ensures anyone can add lights to their layout as quickly and easily as plugging something in.

Just Plug provides a complete, simple way to add realistic LED lighting. This system works with new and existing layouts or projects. The modular design works for all scenes and allows easy, customizable expansion. It is easy to combine and add Pre-Lit Features like Vehicles, Street Lights, Wall Mount Lights or Just Plug-equipped Built-&-Ready buildings. Get started by plugging a Pre-Lit Feature, such as a Built-&-Ready building, into a Light Hub. It truly is as easy as Just Plug and you're done!



GETTING STARTED WITH JUST PLUG ONLINE VIDEO

To get started, you need the very basic and core elements of the Just Plug Lighting System: a Light Hub, Power Supply and a Pre-Lit Feature of your choice.



Product Overview

Light Hub

Use a Light Hub to deliver power to Just Plug lights quickly and easily. The Light Hub is fully compatible with everything from individual LED lights to Pre-Lit Built-&-Ready buildings. Simply plug lights into the four LIGHT Ports on the Light Hub and regulate brightness with individual dimmer controls.

Power Supply

The Power Supply transformer connects to the Light Hub, Sequencing Light Hub or Expansion Hub and powers up to 50 Light Hub Ports or 1,000 milliamps (mA). The Power Supply is available for different regions: U.S., U.K., Europe and Australia/New Zealand.

INSTALLING PRE-LIT FEATURES

All Pre-Lit Features are easy to install on a layout. Once you decide where the feature will be, drill a hole in the layout for the wires and feed the wires through the hole. Choose a location that will be hidden from view or easy to hide later. Then simply plug the wire into the Light Hub and connect the Power Supply to the Light Hub. Once the lights are on, you can adjust the brightness by rotating the dimmer controls. Add up to four Pre-Lit Features to the Light Hub.

Product Overview

Pre-Lit Built-&-Ready Buildings

Pre-Lit Built-&-Ready Buildings include preinstalled LED lighting. These lights include everything from a simple porch light to a flashing light that acts as an air traffic warning light, an interior light for illuminating the whole building, or multiple lights for a single structure.

Street and Wall Mount Lights

Bring any scene to life with LED Street and Wall Mount Lights. Light up city streets, rural roads, sidewalks, parking lots and train yards. These lights can be added to any building, billboard, sign, entryway, home or office.

Billboards

Just Plug Billboards are an easy way to add life and flair to any scene by advertising local shops and destinations. They are a staple of every town and are often found along highways, buildings and rooftops. Each one includes preinstalled LED lighting to highlight the unique designs and add interest to your layout.

Just Plug Vehicles

Whether you're modeling a backcountry drive or a busy downtown scene, these Vehicles instantly add light and interest to any layout. Each vehicle includes a driver and LED headlights and taillights. The taillights are slightly dimmer to simulate a car driving down the street.

Just Plug Flags

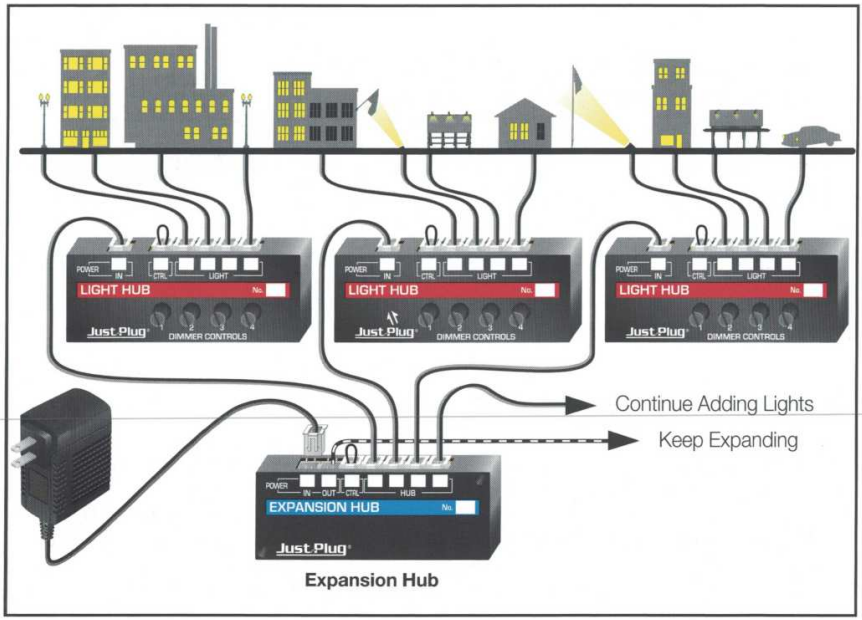
US Flags are available in Pole or Wall Mount versions. Each one is available in three sizes and works for multiple scales. All Flags, as well as the Medium Union Jack Flag Pole, include a Just Plug Spotlight to highlight the Flag.

LED Landscape Lights

Just Plug LED Landscape Lights shed some light on important features and simply plug into a Light Hub or Sequencing Light Hub. Landscape Lights include Spotlights and Floodlights. Use Spotlights to cast a narrow beam of light to highlight building columns, signs, flags or monuments. Choose Floodlights to cast a broad beam of light for illuminating buildings, landmarks and other large areas. Just Plug LED Landscape Lights include two lights per package.

EXPANDING WITH JUST PLUG ONLINE VIDEO

Once your Light Hub is full, you will need to expand your system if you want more lights. The Just Plug Lighting System makes it easy to expand lighting on your layout.



Expansion Hub

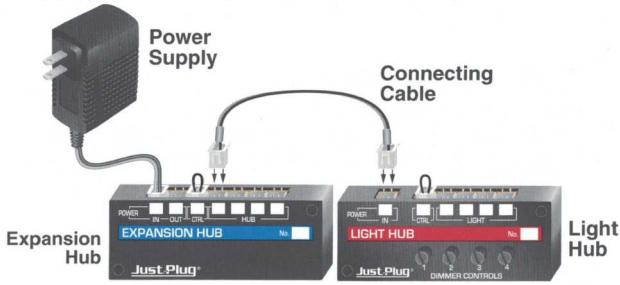
Product Overview

Expansion Hub

Use the Expansion Hub to extend power to 4 Light Hubs or Sequencing Light Hubs, expanding your Just Plug Lighting System quickly and easily. The Expansion Hub includes four Connecting Cables for connecting hubs.

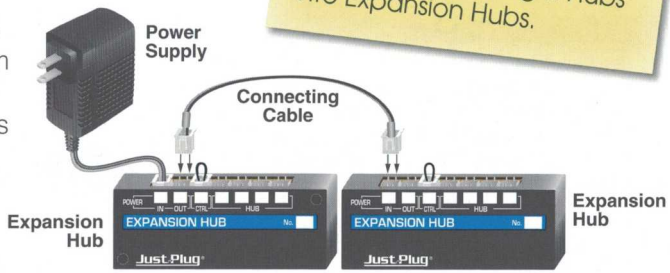
INSTALLING EXPANSION HUBS

To begin expanding, disconnect the Power Supply from the Light Hub. Plug the Power Supply into the Expansion Hub. Then, connect the Expansion Hub to the Light Hub using one of the Connecting Cables included in the Expansion Hub package. As soon as the Power Supply is plugged into electricity, the lights will turn on.



Each Expansion Hub can power up to four Light Hubs. Once your first Expansion Hub is full, you can continue to grow the system by linking Expansion Hubs together, as shown.

NOTE: Only plug Light Hubs and Sequencing Light Hubs into Expansion Hubs.



USING ACCESSORIES

As you expand and enhance your layout with Just Plug features, you may find the need to switch the system or quickly extend the length of your wires. You may also want to create the illusion of occupancy by adding a random effect of lights turning on and off, like they do in a real city. As you expand in the modeling hobby, the need to light dioramas on location in places without power could arise. Just Plug Accessories allow you to do all of these things, simply and easily.

Product Overview

Auxiliary Switch

Use the Auxiliary Switch to control lights with the flick of a switch. The Auxiliary Switch plugs into Light Hubs, Sequencing Light Hubs and Expansion Hubs. Use the rocker-style on/off switch to easily turn the power on or off.

Sequencing Light Hub

Bring your layout to life with a Sequencing Light Hub. Add lights to the four LIGHT Ports that individually sequence on and off. Use the dimmer controls to regulate individual brightness, and use the speed control to adjust the sequence speed. Turn sequencing off to use it as a Light Hub.

Port Sharing Device

The Port Sharing Device is an easy and economical way to expand the Just Plug Lighting System. Use the Port Sharing Device with a Light Hub or Sequencing Light Hub to power up to four Stick-On or Nano LED Lights per LIGHT Port.

Connecting Cables

Connecting Cables are easy-to-install cable plugs that make connections a snap. Connect any hub to an Expansion Hub.

An Expansion Hub is a device that allows one Power Supply to power multiple Light Hubs. Expansion Hubs make it very easy and quick to expand the number of lit features on your layout.

Extension Cables

Use Extension Cables to extend the length of any Just Plug cable. Extension Cables work with the Just Plug Power Supply, Pre-Lit Built-&-Ready Buildings equipped with a Just Plug cable, LED Stick-On Lights, LED Nano Lights, Linker Plugs, Connecting Cables and additional Extension Cables.

Battery Case

The Battery Case provides power and portability to the Just Plug Lighting System. Use the Battery Case as an alternative to the Just Plug Power Supply to power Light Hubs, Sequencing Light Hubs and Expansion Hubs. The Battery Case requires two 9-volt batteries.

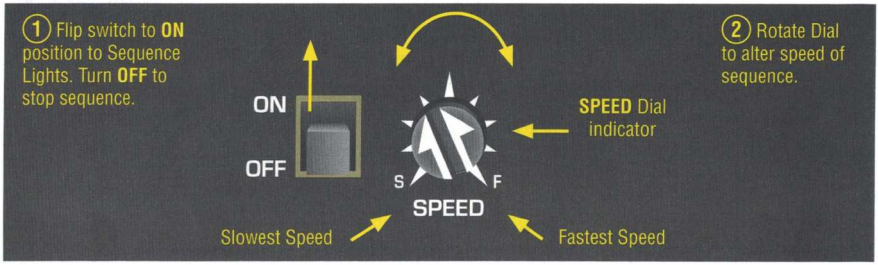
Tidy Wire Kit

The Tidy Wire Kit gives you easy access for expansion while keeping cables secure and tidy. Attach the Cable Tie Mounts to your layout with their adhesive-backing and secure cables with Cable Ties to keep them clear of your layout. Use the Cable Tie Labels to identify connections.

ENHANCE REALISM

In a real city, if you watch a large building at night you will notice that the lights in individual rooms blink on and off as people move throughout a structure. The Sequencing Light Hub makes it simple to mimic this effect and increase realism of your layout. A Sequencing Light Hub works just like a Light Hub except it has an additional sequencing feature that turns lights on and off in a sequence that appears random. The speed of the sequence can also be adjusted to tweak the effect on the layout.

Swap out a Light Hub for a Sequencing Light Hub and initiate the sequence by flipping the sequencing switch on. Then rotate the speed dial to increase or decrease the sequence of lights turning on and off.



Light individual rooms in apartment buildings, homes or offices with the Sequencing Light Hub. Block some windows in the building so that some rooms always remain dark while in others the lights turn on and off. For the most realistic results, try spreading the lights throughout buildings and the layout. The sequencing effect is best achieved when the Sequencing Light Hub is used with other Light Hubs. The lights connected to Light Hubs will remain on continuously while those connected to the Sequencing Light Hubs blink off.

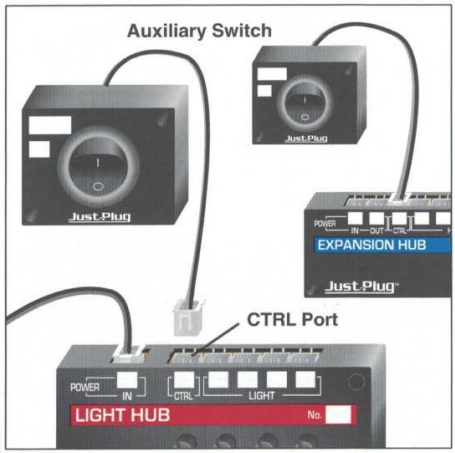
However, we do not recommend using the Sequencing Light Hub for Pre-Lit Features like Street Lights, Billboards or Flags. These lights remain fixed in real life and typically remain lit all night.

BATTERY POWER

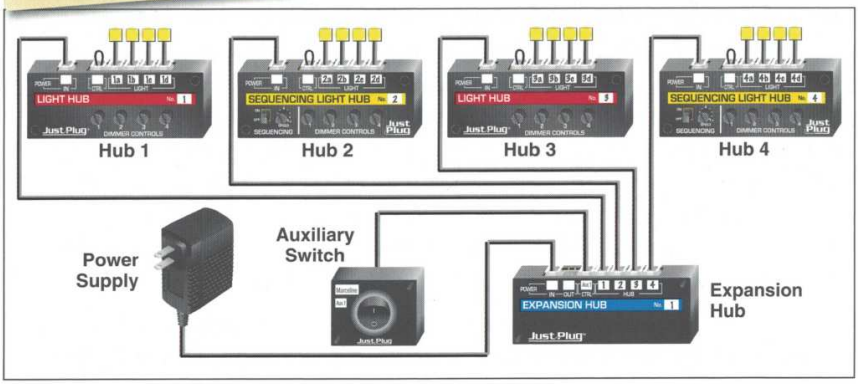
If your location has no access to wall outlets, you can still power your Just Plug lights. The Battery Case is powered by two 9V Batteries and plugs into Hubs just like the Power Supply. Every lighting configuration is different and will affect how long the batteries last. About 30 lights can be powered for approximately 5-6 hours with the Battery Case.

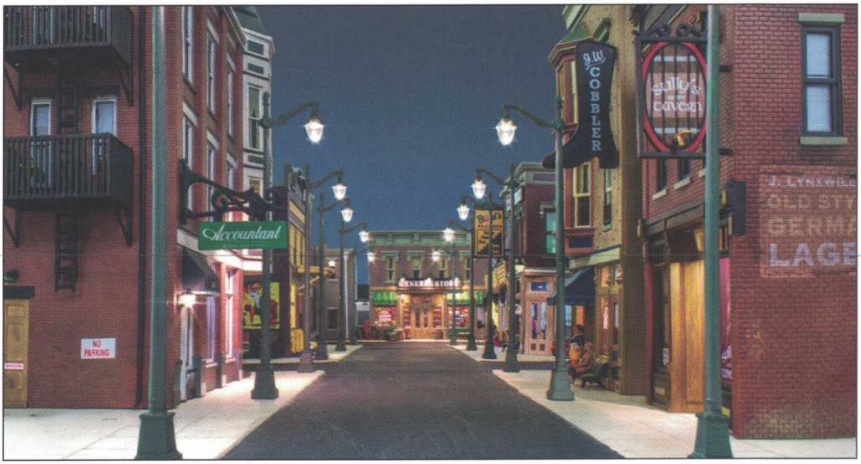
SWITCHING THE JUST PLUG SYSTEM ONLINE VIDEO

As you expand, you may want to consider adding an Auxiliary Switch so that you don't have to crawl under benchwork to reach the Power Supply transformer. Adding an Auxiliary Switch is simple. Plug the Auxiliary Switch into a Light Hub, Sequencing Light Hub or Expansion Hub's CTRL Port. Then, any light connected to the Hub will turn on and off with the flip of the Auxiliary Switch.



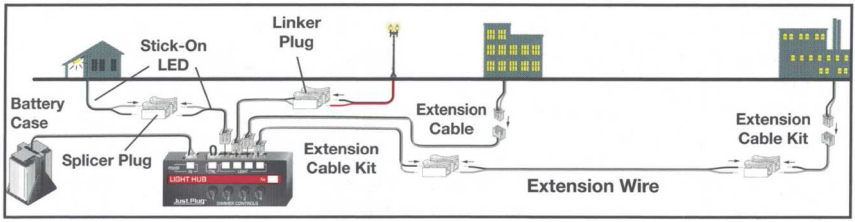
NOTE: The CTRL port can only be used to connect an Auxilliary Switch, or DCC, to a Hub. The CTRL port cannot power LEDs or Hubs.





CUSTOMIZE

Easily adapt Just Plug to extend wire length, drill smaller holes, create custom wire connections, light unlit features, or eliminate building glow.



Product Overview

Lights & Hub Set

Use the Auxiliary Switch to control lights with the flick of a switch. The Auxiliary Switch plugs into Light Hubs, Sequencing Light Hubs and Expansion Hubs. Use the rocker-style on/off switch to easily turn the power on or off.

Stick-On and Nano LED Lights

Stick-On and Nano Lights are available in a variety of colors and can be added anywhere you need lights, such as a building or vehicle. Stick-On Lights are adhesive-backed for easy installation and come in 7 colors. Nano Lights are small, bright lights that are available in 7 colors and 2 flashing options. Stick-On and Nano LED Lights simply plug into a Light Hub, Sequencing Light Hub or Port Sharing Device.

It's as easy as placing a light and setting your building on top.

STICK-ON

Adhesive-backed for easy installation

- Orange
- Green
- Blue
- Red
- Warm White
- Cool White
- Yellow

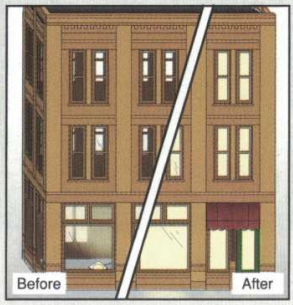
NANO

Small in size, big in brightness

- Warm White
- Yellow
- Red
- Green
- Blue
- Cool White
- Orange
- Yellow Flashing
- Red Flashing

Light Diffusion Window Film

This product diffuses light evenly throughout when lights are on and eliminates the need for a building interior. It blocks the outside view through the windows of an empty building, while still allowing light to shine through the windows from the inside. Use the optional Window Tint together with Diffusing Film to make windows appear dark when lights are off. The Tint and Film material is easy to apply, and each will cover approximately 216 in^2 of window space.



Light Block Kit

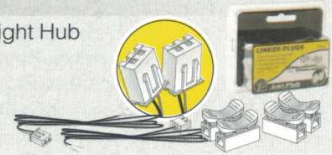
Keep light inside a structure, where it belongs! Seal all light leaks easily by pressing Ribbon Putty into interior corners and joints. Affix it along the bottom edges of structures to secure building to layout surface and block light from bleeding along foundations. Apply Masking Paint to keep light from glowing through walls and shining through windows. Putty will cover 96 linear inches and Paint will cover 1,200 in^2.

Splicer Plugs

Splicer Plugs make it easy to properly connect stripped wires. Use Splicer Plugs to quickly reconnect wires after installing LEDs into discreet, small holes.

Linker Plugs

Linker Plugs are ready to plug into a port on a Light Hub or Sequencing Light Hub. Use them to plug in remotely located Street and Wall Mount Lights.



Extension Wire and Extension Cable Kit

Extension Wire is Just Plug-compatible and has soft insulation for easy stripping. Paired wire is color-coded for proper connection with Splicer Plugs and the Extension Cable Kit.

Use the Extension Cable Kit with Extension Wire to create custom lengths of Just Plug Cables. This allows you to reach Hubs anywhere on your layout or project.

EXTENDING JUST PLUG CABLES

Some layouts can be very large and may have unique situations where the usual methods of expansion are not enough. You may have one Street Light that is too far away to reach the included Linker Plug, or there may be one lone house on the outskirts of town. You can extend the length of the cables to easily reach your Light Hubs.

Using Linker Plugs

Connect a lit feature's pigtail wires to the Linker Plug. Then plug the Linker Plug into a Light Hub or Sequencing Light Hub.

Using Splicer Plugs

Using a Splicer Plug allows you to drill smaller holes in your modeling material. This is because the drill hole only has to be the size of the wire, not the size of a plug. Use Splicer Plugs to connect pairs of pigtail wires from buildings, Extension Wire, Street Lights, Wall Mount Lights, Flags, etc. To use, press the tabs on the top of the Splicer Plug and insert the bare wire into the Splicer Plug and repeat on opposite end, matching positive and negative wires on each side.

Using the Extension Wire and Extension Cable Kit

Extension Wire is a roll of Just Plug wiring that can be cut to any length you desire. Extension Cable Kits come with both male and female pigtail wires and Splicer Plugs, which means you can extend the length of any wire. When the Extension Cable Kit is used with Extension Wire, you can create any length of Just Plug cable.

Using Tidy Wire Kit

Use the Tidy Wire Kit to bundle wires together and then secure to the underside of the base with the included adhesive backing. After running the wires, create a diagram showing where the wires are located. Refer to the diagram before doing future modifications that require cutting into the layout.

LIGHTING EXISTING FEATURES

Pre-lit Features come equipped with lighting, but many features are not built with lighting. You can light unlit structures and features with Stick-On and Nano LEDs. Stick-On and Nano LEDs can be used to light any project for unique effects. These LEDs come in a variety of colors that can be used to make any model or art project shine. Use them to create a phosphorescent look in water features, to make lava flows glow or use them in free-standing sculptures to highlight specific features.

Follow the below techniques to permanently install Stick-On and Nano LEDs in unlit features and structures.

Choosing a Color

Warm White LEDs represent incandescent light, which is a warm yellowish color light. Incandescent light is the kind of lighting that was very common in the mid-twentieth century in private homes. Cool White LEDs are closer to the color of daylight. They should be used where fluorescent lighting would be installed like in hospitals, schools, businesses or in other areas that must be brightly lit.

Use colored LEDs to add lighting accents. Red LEDs are often used as safety lights on buildings, but can also be installed in vehicles as taillights. Yellow and Orange LEDs can be used to simulate old gas and oil lamps that were powered by various gasses or oils. Gas and oil powered lights produce a very yellow-orange light. Green and Blue LEDs can be used in industries for different kinds of signals. Add Flashing Yellow or Red LEDs to buildings, docks, ships, bridges, etc.

When Warm White and Cool White LEDs are used with tinted materials, like tinted Deep Pour Water, the color will be the color of the material covering the LED. When using a colored LED to light clear materials, the clear material will assume the LED's color. However, if you use a colored LED to light a colored material, the color of light will change and the brightness may be affected.

Where to Install, Nanos vs Stick-Ons

When choosing LEDs, it is important to consider the brightness of the light. Each structure will be different and require different lighting configurations for different effects.

Stick-On LEDs are brighter than Nanos. Too bright of light is not typically a problem, because you can control the brightness of the light with the Dimmer Controls on the Hub. If unsure of the amount of light needed, try a Stick-On and dim as needed.

In general, large buildings and features tend to need more light to achieve a realistic look. Small buildings and features may be overpowered by too bright of a light. As O Scale structures are large, you will likely need more Stick-On LEDs than Nanos to achieve the desired effect. HO Scale can get good results from either Stick-Ons or Nanos, depending upon the size of the area that needs to be lit. As N Scale structures are very small, Nanos are usually a better option.

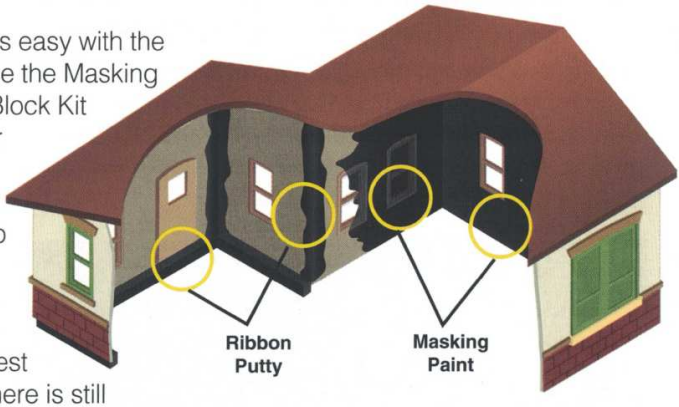
Both Stick-On and Nano LEDs are directional lights, which means they must be aimed to illuminate an area. You can use two Stick On or Nano LEDs placed back to back if a 360-degree light is desired. Nano LEDs are very small, and are ideal to install in tight areas and can also be used as drop-down ceiling lights.

Check for Light Bleed ONLINE VIDEO

The first two steps in installing an LED are establishing the location of the LED and testing for light bleed. Light bleed is when light leaks from the object in areas that should not be lit.

Start by determining where you want to install the LED. Turn the lights in the room off, and test the LED in a few different positions within the object. Use some tape to temporarily adhere the LED while you assess the positioning. When you find the right positioning, make a mark where the LED should be permanently installed.

Once the LED is positioned how you like it, check for light bleed. Light bleed can be seen when the object is in a dark room and the LED is turned on. If light is escaping where you do not want it to escape, you will need to seal or paint that area to stop the bleed before permanently installing the LED.



Fixing light bleed is easy with the Light Block Kit. Use the Masking Paint in the Light Block Kit to paint the interior walls a flat black. This will stop wall glow and may stop light bleed from wall joints. After you have painted the interior walls, test for light bleed. If there is still wall glow, add another coat of Masking Paint. If light is bleeding only from the wall joints, use the Black Ribbon Putty. Stretch the Black Ribbon Putty over the wall joint and press it into the wall joint. Keep testing and making adjustments until the light bleed is eliminated. Also use the Ribbon Putty to block light from escaping the bottom of the building (page 224).

For unique art and craft projects, you may or may not be able to use the Light Block Kit to stop the light bleed. If the black Masking Paint and Ribbon Putty do not seem to be a good fit for your project, use the same materials that you used to construct the object to block the light bleed. Fill the gaps, test for light bleed and repeat as needed.

Permanently Install the LED

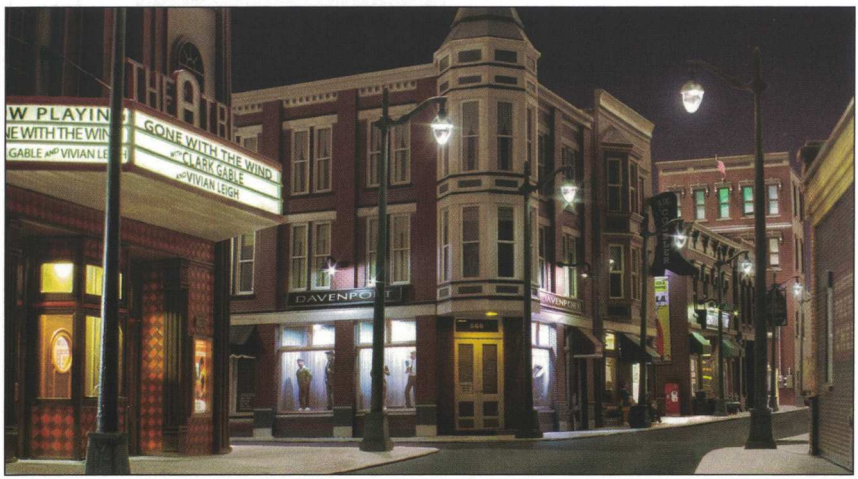
Once light bleed has been addressed, you can permanently install the LED.

Permanently install a Stick-On LEDs by peeling the backing paper from the LED and press in place on the positioning mark you made inside the object. To permanently install a Nano, use cyanoacrylate adhesive (super glue), masking tape or double-sided sticky tape to secure the LED in place.

Once the LED is permanently installed and the glue is dry, run the wiring down a corner of the object that will not be visible to a viewer. If desired, paint the wiring with acrylic paint so that it is inconspicuous and blends into the surface it is against. If lighting a building with an interior, run the wiring down the back of the interior cardstock so it is not visible. Use a little tape or glue to secure the wire. Then, drill a hole, insert the LED wire in the hole and connect to a Light Hub.

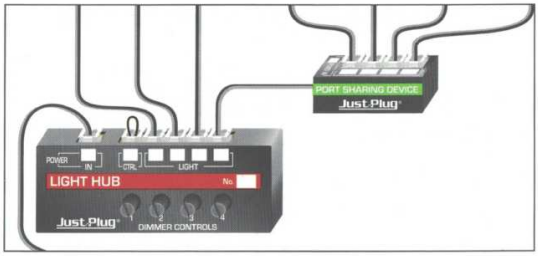
Drilling Smaller Holes

When using Stick-On and Nano LEDs, say under an awning on a building, you will need to drill through the building to feed the LED's plug through it. A hole the size of a plug would likely be visible on any building. However, you can use Splicer Plugs to drill smaller, inconspicuous holes. Clip the plug off of the Stick-On or Nano LED about 3"-5" above the plug. The 3"-5" piece with the plug is called a pigtail. Don't throw the pigtail away. Run the LED's wiring through the small hole drilled in your building. Strip the wire insulation from the pigtail and the LED's wire. Connect both the pigtail and the LED wire to a Splicer Plug. Then, insert the pigtail's plug into a Light Hub or Sequencing Light Hub.



Adding LEDs with Port Sharing Devices

When using Stick-On and Nano LEDs, you can expand the number of LEDs that a Light Hub powers. Plug a Port Sharing Device into either a Sequencing Light Hub or a Light Hub light port. Then, plug your Stick-On or Nano LEDs into the Port Sharing Device. This is a quick and easy way to expand the number of Stick-On and Nano LEDs on your layout.

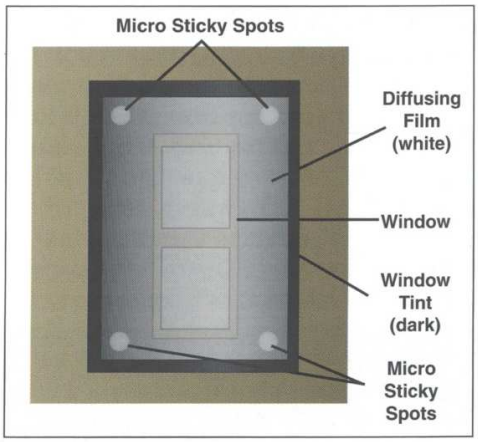


Light Diffusing Window Film for Buildings ONLINE VIDEO

If you are lighting a structure, it is likely that the structure doesn't have an interior. Viewers looking into the windows of the structure will be able to see the unpainted and unfurnished interior. You can fix this by using the Light Diffusing Window Film kit.

The Diffusing Film blocks the outside view through the windows of an empty building while allowing light to shine through the windows from the inside. When used with the Window Tint (included in the package), the windows will appear dark when the lights are off.

To install, cut the Diffusing Film slightly larger than the window. Apply the included Micro Sticky Spots to the corners of the Diffusing Film and press in place on the building.

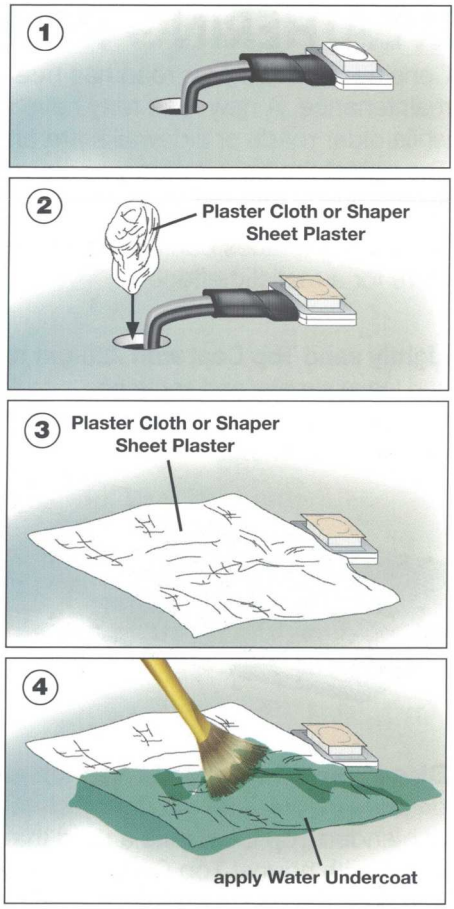


LEDs in Deep Pour Water

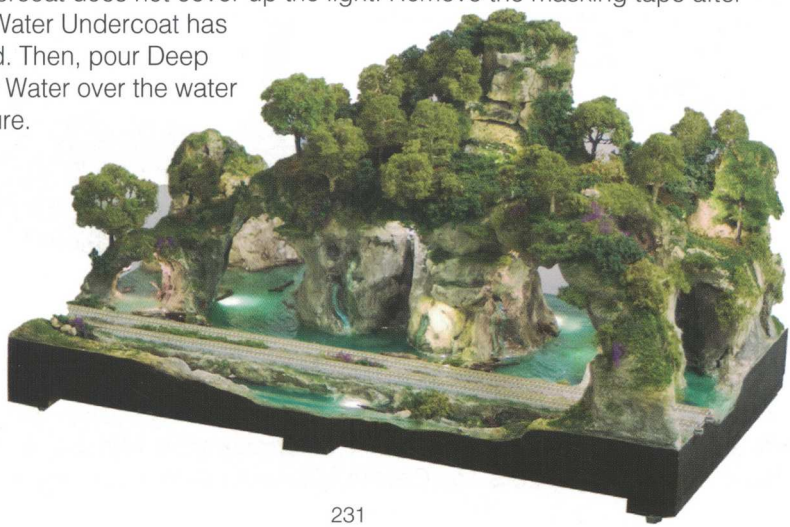
Lava is molten rock that is so hot, it glows. If you are modeling a volcanic area like Hawaii or Iceland, you may want to include glowing pools of Deep Pour Water that is lit with a red or orange LED. There are also occasions where water will glow. Phosphorescence or bioluminescence (glowing water) is a natural phenomenon that occurs in bodies of water where certain kinds of algae and aquatic life exist. Water in pools and fountains also tend to glow since pools and fountains often have lights lining the walls.

Modelers can achieve these looks by submerging Stick-On and Nano LEDs directly in Deep Pour Water. Please note that we only recommend these techniques with Deep Pour Water. Be sure to test the LED for functionality before permanently installing it in Deep Pour Water.

Install the LED directly in the base of the water feature. Install the LED after applying plaster to the terrain contours and before the Water Undercoat is applied. Let the plaster base dry thoroughly before installation. **(1)** Drill a hole and run the LED wire through the hole. Secure the LED and place piece of masking tape over the LED to protect it. **(2/3)** Then, seal the hole in the terrain shell with the plaster product used for the water base.



(4) Paint the water base with Undercoat as described in the Water section in Chapter 3. Paint any exposed wire, or glue, with Water Undercoat and let it dry. For the most realism, cover the hole and wiring with underwater landscaping, like rocks. Keep the LED masked off so that the Water Undercoat does not cover up the light. Remove the masking tape after the Water Undercoat has dried. Then, pour Deep Pour Water over the water feature.

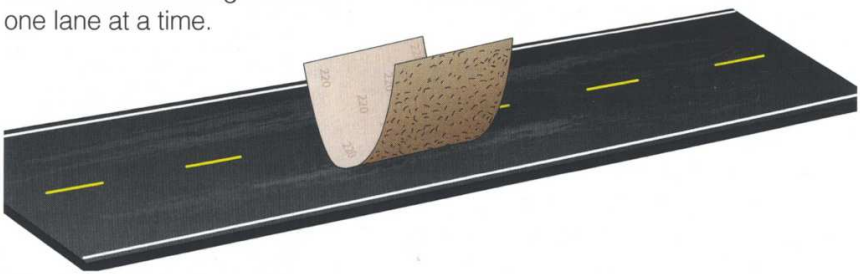


WEATHERING ROADS

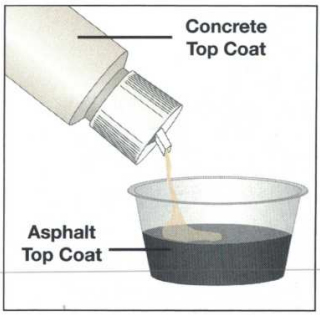
Consider whether your road has been freshly paved or in need of some maintenance. A new road may have a pristine surface and dark finish, while older roads or sidewalks are often faded with cracks or potholes. The age of the paved area you are modeling will determine how much weathering is needed.

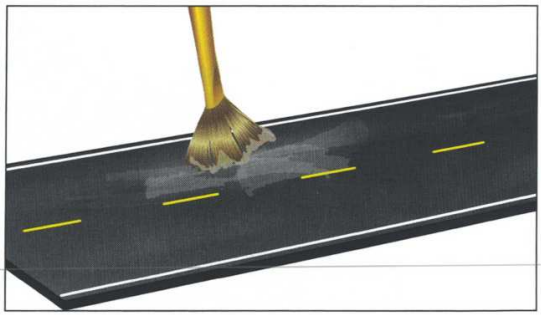
Several techniques can be used for weathering pavement. Try one or more for a realistic effect:

Lightly sand Top Coat with 220-grit sandpaper. This will alter the color and leave streaks and scratches, simulating road wear. Fold the sandpaper to the width of a single lane and sand the road one lane at a time.



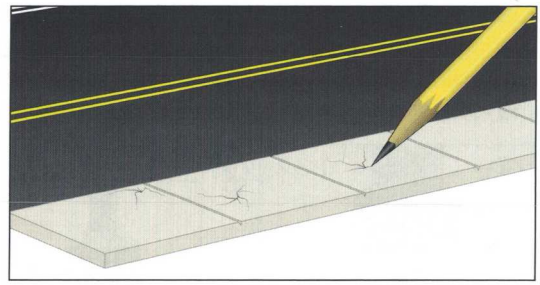
Blend a small amount of Asphalt and Concrete Top Coats to make different colors. Use the dry brush technique to dab spots or streaks of blended Top Coat onto a road that has already been painted (and dried) with normal Top Coat. Start with a blend of 10% Concrete and 90% Asphalt Top Coat. Experiment with mixing other blends for different color effects. This should give the appearance of skid marks or oil puddles. The more random and blotchy these areas look, the more realistic they will be.



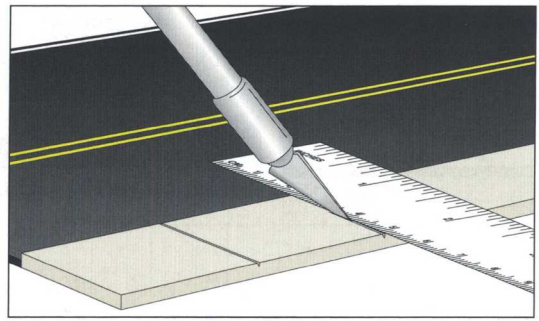


Dilute Top Coat with water. Use thinned Top Coat to paint the road surface where there is discoloration from tires. Blot the dilution on the road with a wadded rag or sponge for a mottled appearance. Use a dilution ratio of approximately 20% Top Coat to 80% water to reduce shininess.

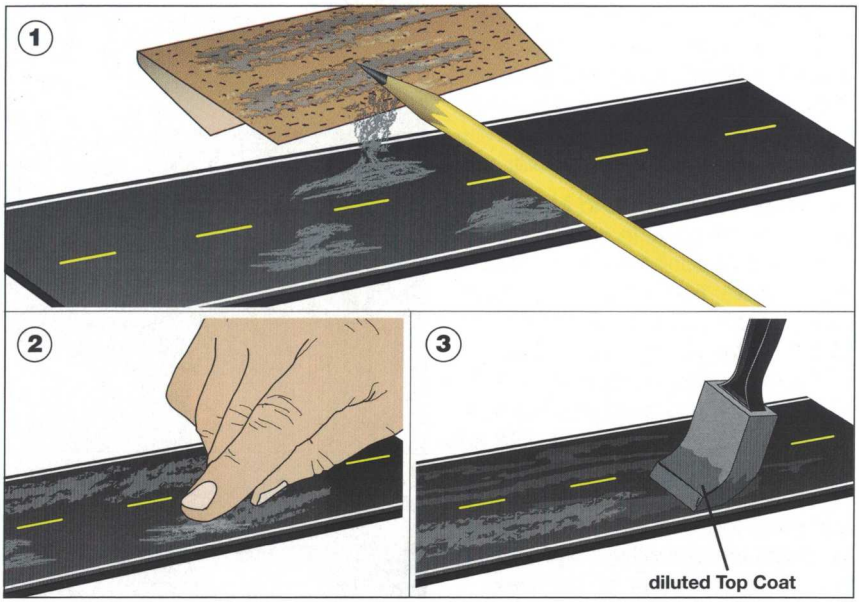
Draw cracks in the pavement with a sharp pencil. Lines do not need to be precise. Draw in a jagged line for a natural look.



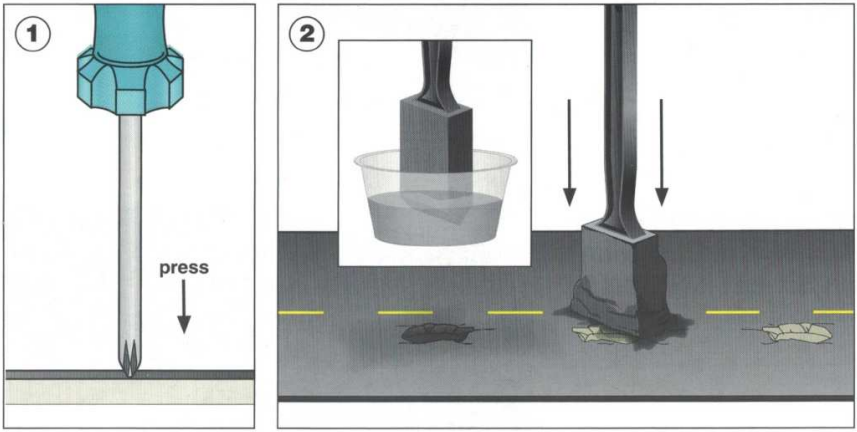
Make expansion joints in sidewalks by scoring dry Smooth-It with a sharp knife.



Rub a graphite pencil on coarse (80-grit) sandpaper to produce powdered graphite. Rub graphite on streets and sidewalks with your fingers for natural looking wear. Push some additional graphite into cracks and sidewalk expansion joints for more definition. Then brush diluted Top Coat over it to reduce shininess.



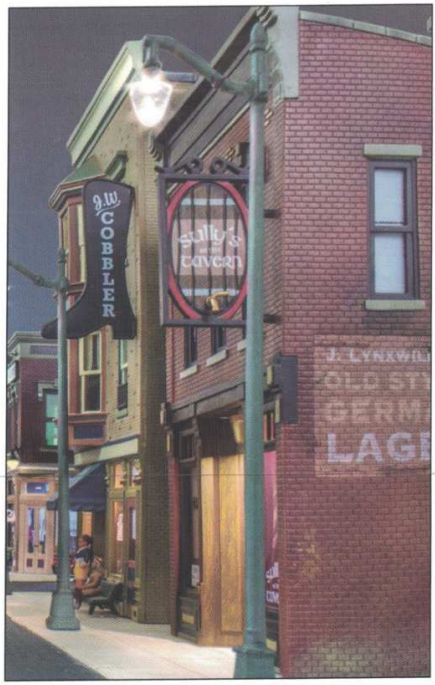
Make potholes by breaking holes in the surface of the Smooth-It with a screwdriver. Then dilute Top Coat with water. Use a dilution ratio of approximately 20% Top Coat to 80% water. Brush diluted Top Coat over the road surface, letting it pool in the pot hole.



SIGNS AND GRAPHICS

Buildings, signs, train cars and engines almost always have some kind of writing, numbers or pictures on them. The layout will appear bland and unrealistic if this facet of the real world is not duplicated.

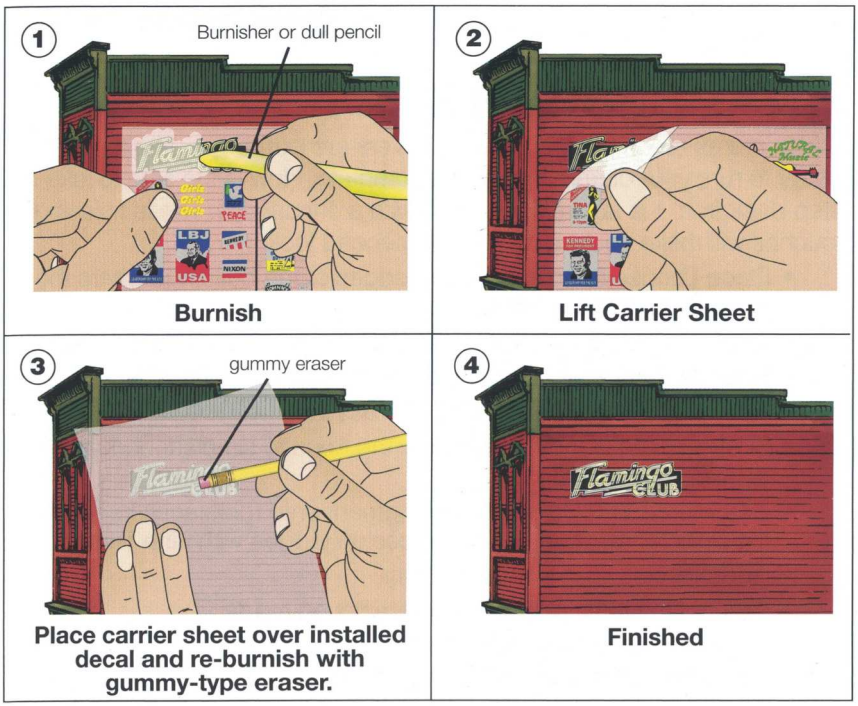
Dry Transfer Decals and Model Graphics® are a very effective method of detailing engines, rolling stock, buildings, fences, vehicles and other items. Many decals and graphics, like Stripes, Numbers and Letters, can be used with any time period, but there are also signs you can use to indicate a particular era.



Dry Transfer Decals and Model Graphics are easy to use on either smooth or textured surfaces, leaving no unnatural film around the edges. Dry Transfer Decals adhere to wood, metal, paint, plastic, paper and other surfaces. Decals include some letters and numbers, as well as railroad heralds, boxcar data and labeling, warning signs, business signs, advertising signs, posters and company logos. It is even possible to create individualized signs using the letters, numbers and stripes.

ATTACHING SIGNS AND GRAPHICS ONLINE VIDEO

Dry Transfer Decals and Model Graphics are very easy to use, even for beginners. Start by cleaning the application area with warm soapy water. Let it dry. Then position the Decal where desired and gently rub the back of the carrier sheet with a burnisher or dull pencil. Slowly lift the carrier sheet off of the surface. Place the backing paper over the Decal and burnish again to ensure a good bond, smoothing out small wrinkles and bubbles. When attaching to a textured surface, press the Decal into the surface with your thumb or a gummy-type eraser. The Decal will stretch and adhere into the cracks and crevices.



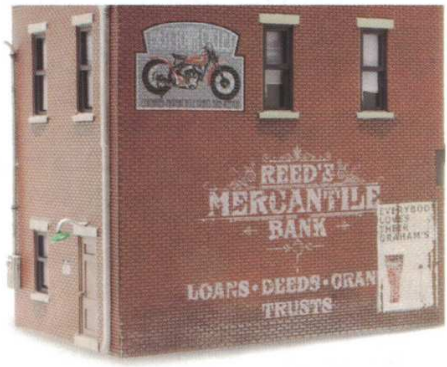
Numbers, letters, stripes, boxcar data and warning signs can be used on engines and rolling stock to create extra detail, add color and personalize them for your railroad. To make sure letters line up straight, tape a paper straightedge guide just below, or above, the application area. Position each letter so it is aligned with the guide, then transfer. If you are applying stripes, use other stripes on carrier sheet as a parallel guide for placement.

To correct a mistake, use masking tape to lift the Decal from the surface. The tape will grab the decal and release it from the building when you pull it. Use scotch tape for Decals that do not release easily.

Use a matte finish, clear coat lacquer to permanently fix your Decals in place. Apply in very light coats.

WEATHERING DECALS

A brand new Decal may look out of place on an old and weathered structure. Weather your Decals after application by scoring and chipping them with a hobby knife. Use paint or chalk as described in the Weathering section (page 213) to age the Decal.



FINAL DETAILING

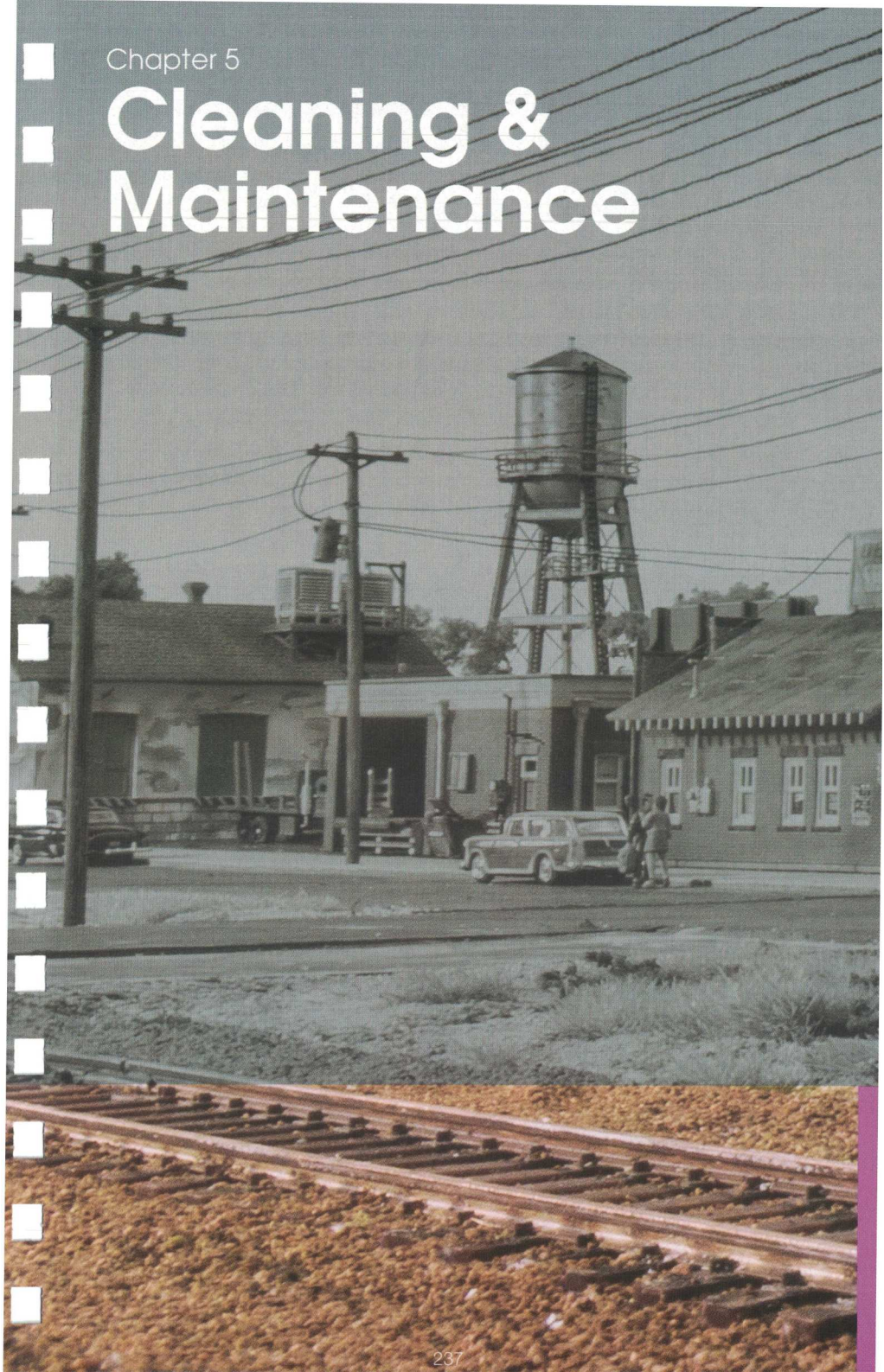
All structures are in place, lakes and rivers are poured and trains are ready to run; your diorama is almost complete. Now is the time to take a step back from the layout and view it with a critical eye. These finishing touches will make your layout worth a second look:

- Place Landscaping around the edges of the buildings where the installation process left seams.
- Apply Flowers to bushes or fields along the edges of the forest.
- Sprinkle Plant Hues over the grass to add some variation.
- Add a few Field Grass or Static Grass tufts.
- Scatter some Dead Fall beneath the trees to simulate bark and broken limbs or twigs.
- Dab more Earth Colors Liquid Pigment onto rock faces to deepen the color or simulate dirt and moss on ledges with Fine Turf.
- Add oil spots around any industry.
- Create tire skids, potholes and cracks on roads.
- Include Scenic Accents pedestrians walking through the town or sitting on benches, waiting for a friend.
- Swap a Light Hub out for a Sequencing Light Hub to create the illusion of activity.
- Dab Water Ripples on the surface of your water feature to create subtle chop.
- Transform the calm little creek into a roaring, rushing river using Water Waves, topped with White Water Highlight.
- Use Water Effects to add dripping icicles.

When you think you have finished the scene, work on a different project for a little while. Then, take another hard, long look at your layout. Review your original layout plan and any sketches you may have made. Is there anything you missed during the construction process? In most instances, you will be able to add the feature you forgot very easily. Each time you look at your masterpiece, you will likely see something new that you want to adjust. Keep adding finishing touches until you are ready for a new project.

Chapter 5

Cleaning & Maintenance



Now that your layout is built, you will want to display your hard work. Layouts look the most impressive and realistic when they are free of dust, dirt and grime. While your layout may not be dirty when you finish construction, it is not immune to accumulating dirt and dust. Just like the top of a bookshelf, dust will eventually settle onto your layout.

Whether you have track, a water feature or ground cover that needs cleaning, there are several ways to clean your layout without causing any damage. However, it's important to note that being proactive and taking preventative measures is always the best option. Cover your layout with cloth or a tarp to protect it. Use the techniques described in this chapter on a regular basis to prevent heavy dust accumulation. These are the best ways to keep your layout in optimal condition.

As with previous chapters, products will be introduced prior to any instruction. Be sure to read the entire chapter before cleaning features on your layout.

CLEANING TRACKS AND WHEELS

Over time, dust and lubricant residue can build up and create grime on tracks and train wheels (trucks). This grime can cause the loss of conductivity, arcing, unreliable DCC operations and premature motor failure. To keep trains running, model railroaders must perform regular track maintenance.

It is important to clean and maintain track with the proper tools and materials. Overly abrasive products scratch track and damage rails, while applying oil inhibits engine performance. The Tidy Track Rail and Wheel Maintenance System provides quality products that make regular track and train maintenance easy.

TIDY TRACK® RAIL AND WHEEL MAINTENANCE SYSTEM ONLINE VIDEO

Tidy Track is a complete system that includes all the tools you need for corrective and preventive maintenance of your track and wheels. This system is easy, efficient, thorough and safe for your equipment. Use Tidy Track to improve conductivity for optimum performance, extend the life of your train and track, and protect your investment. Tidy Track will not harm rails and removes oil for improved engine traction.

Rail Tracker™ Cleaning Kit

The Rail Tracker Cleaning Kit includes the Rail Tracker and Rail Tracker Handle, Clean Track Solution, Maintenance Pads, Rescue Pads, Cleaning Pads and Finishing Pads. The pads attach to the Rail Tracker, which is a cleaning tool that follows the track and hugs the rail while you clean. Attaching the handle makes it easy to clean hard to reach areas like inside tunnels, around structures and under power lines.

The package doubles as a tray for storage, and the pads can be replaced as necessary. The Rail Tracker Cleaning Kit was designed to work on N, HO, HOn3 and three-rail O scale track.

Patent Product

Perfect for hard-to-reach areas

Ergonomic design

Maintenance Pads

Use Maintenance Pads with the Rail Tracker for routine cleaning to remove grime and oxidation.

Rescue Pads™

Use Rescue Pads with the Rail Tracker for semi-annual cleaning to remove heavy build-up.

Cleaning & Finishing Pads

Use Cleaning & Finishing Pads with the Rail Tracker and Clean Track Solution to remove dirt and make the track ready for operation.

Clean Track Solution™

Use Cleaning & Finishing Pads with the Rail Tracker and Clean Track Solution to remove dirt and make the track ready for operation.

Rail Pal™

Keep the two-sided Rail Pal handy for quick fixes. Use the Rail Pal to smooth track imperfections and remove dirt and track contaminants, such as paint, adhesives and grime. The Rail Pal does not crumble and is two-sided for light and heavy cleaning.

Roto Wheel Cleaner™

The Roto Wheel Cleaner is a fast, easy way to clean rolling stock wheels. There is no scratching and all wheels are cleaned at once. The Roto Wheel Cleaner can be powered via a transformer or track and works with both analog (DC) and digital (DCC) control systems.

N scale accommodates locomotives up to 6 3/8" and rolling stock up to 5".

HO scale accommodates locomotives up to 12" and rolling stock up to 10 1/4".

Patent Product

Roto Pads™

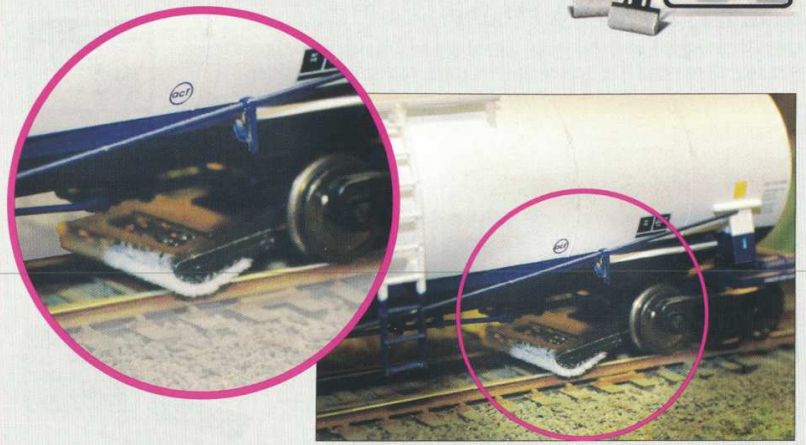
Roto Pads are easy-to-apply replacement pads for N and HO scale Roto Wheel Cleaners. The Cleaning and Scrubbing pads will not scratch wheels.

N Scale Cleaner: 6 sets of Cleaning Pads, 2 sets of Scrubbing Pads

HO Scale Cleaner: 3 sets of Cleaning Pads, 1 set of Scrubbing Pads

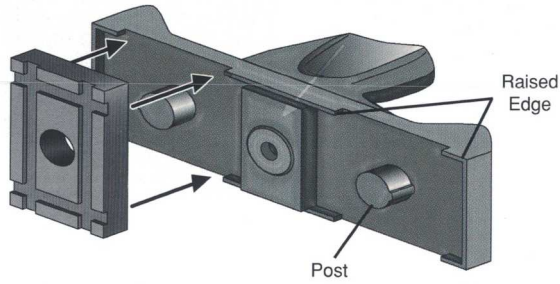
Dust Monkeys®

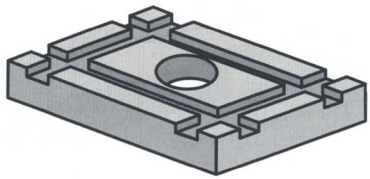
Dust Monkeys are a convenient way to remove dust from track and stop further accumulation during regular train operation. They hang from rolling stock axles out of sight.



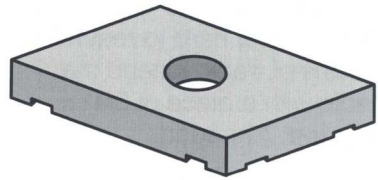
HOW TO CLEAN THE TRACK ONLINE VIDEO

Get started cleaning your track by installing the Pads on the Rail Tracker. To install, simply slide the Pad over the center post. Position the pads differently depending upon what scale you are modeling in and whether you are cleaning curves or straightaways.

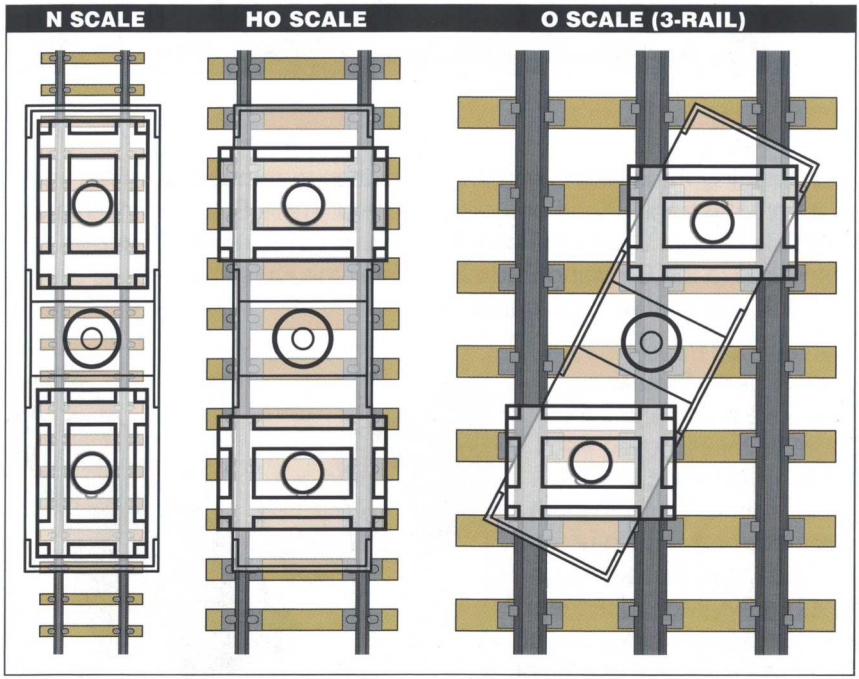




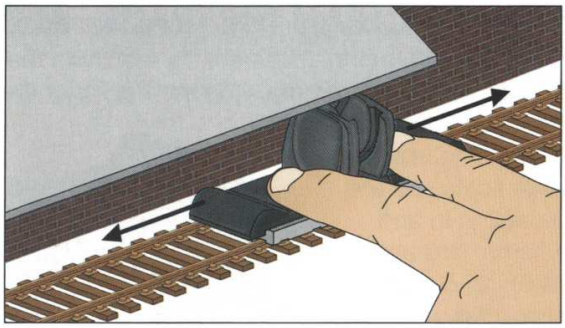
GROOVED SIDE
straightaways and curves



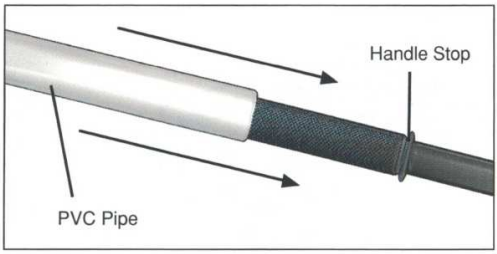
SMOOTH SIDE
switches, turnouts and road crossings



Now you can begin cleaning. Slide the Rail Tracker over the track. On curves, unlock the Rail Tracker.

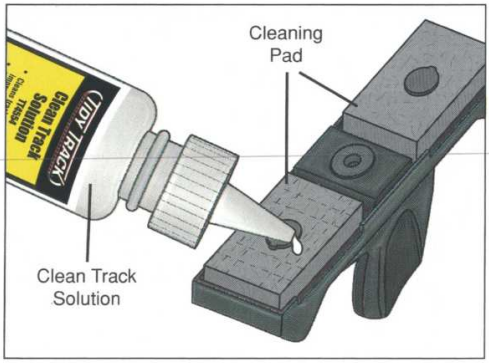


Use the Rail Tracker Handle to guide the Rail Tracker along hard to reach sections of track. Extend the handle with a piece of 3/4" PVC pipe, if needed.



Use Cleaning Pads with Clean Track Solution to remove oil, grime and dust from the track. Place one drop of Clean Track Solution on left and right side of both Cleaning Pads. Run the Rail Tracker over the rails. Then remove the Cleaning Pads and install the Finishing Pads to dry the track and ensure track conduction.

Maintenance Pads are for monthly general cleaning to remove grime and light oxidation for improved track conductivity. Rescue Pads are for semi-annual cleaning to remove heavy build-up and oxidation, and smooth rough spots on the track. Use them after landscaping your layout to remove adhesive and paint.



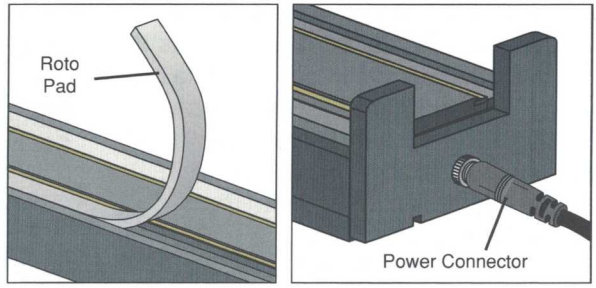
CLEANING LOCOMOTIVES AND ROLLING STOCK

ONLINE VIDEO

If your tracks are grimy, it is likely that the wheels on your train are, too. Part of regular track maintenance should also include cleaning the wheels on locomotives and rolling stock. The Roto Wheel Cleaner makes this an easy task.

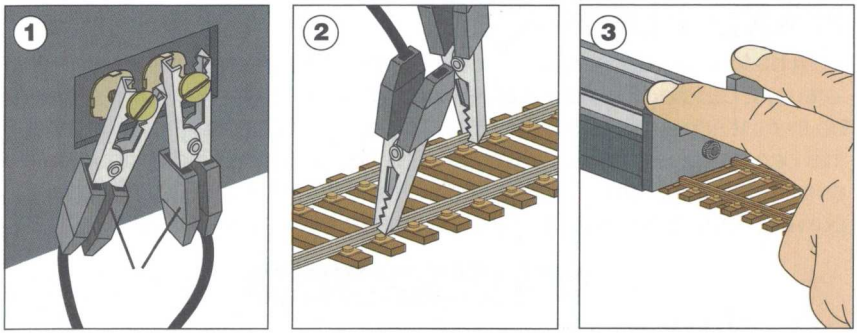
Locomotives

Install the Roto Pads in the channels on either side of the center rail. Use Cleaning Pads (light colored) for general cleaning. Use Scrubbing Pads (dark colored) for wheels with heavy grime build-up. Position the Pads so they are flush against the outside edge of the channel. Press the Pads in place. The Pad should not touch the contacts on the center guide. Then, plug in the Power Connector.



Set your train transformer to off and speed controller to 0. Then, power the Roto Wheel Cleaner in one of three different ways:

① Attach the alligator clips to a DC track connection on the transformer.
② Attach the alligator clips to working track.
③ Place the whole Roto Wheel Cleaner on working track.

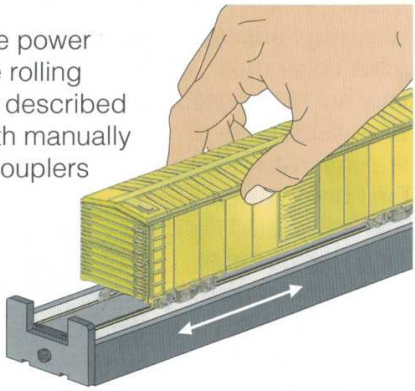


Place the locomotive in the center of the Roto Wheel Cleaner so the wheels make contact with the power rails on both sides of the center guide. Turn on the train transformer and increase the speed slowly (do not operate at high speed) until the locomotive bumps against the end guard. Manually pull the engine back to the rear end guards, applying slight downward pressure. Then release the train. It will roll forward. Repeat this process for approximately 10-15 seconds. Adjust the speed to 0 and turn the transformer off. Manually inspect the wheels. Repeat if needed. If the grime on the wheels is very thick, try putting a few drops of rubbing alcohol on the Roto Pads. This will help lift thick, stuck-on grime.

Always use Cleaning Pads after Scrubbing Pads to remove residue. Rotate the Pads 180 degrees when they begin showing signs of excessive wear along the inside edge. If the adhesive on the Pads wears out, apply double sided sticky tape to the back of the Pad to refresh. Do not throw away Pads between uses. Replace the Pads when they begin to show excessive wear.

Rolling Stock

To clean rolling stock, disconnect the power to the Roto Wheel Cleaner. Place the rolling stock on the Roto Wheel Cleaner, as described previously. Roll the car back and forth manually for approximately 10 seconds. The couplers should clear the end guards. Apply enough pressure to depress the center guide and allow wheels to roll along the top of the Roto Pads. Do not apply excessive pressure. Manually inspect wheels and repeat as needed.



CLEANING WATER FEATURES AND HARD SURFACES

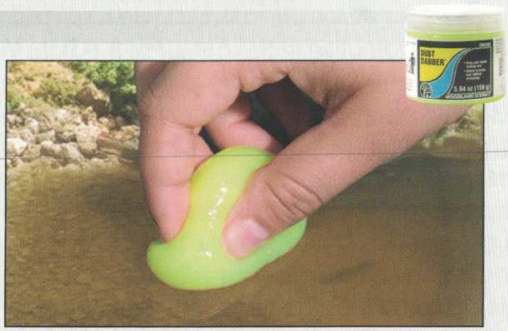
Dust build-up is especially noticeable on hard surfaces like water features, buildings, road surfaces and vehicles. Your first instinct may be to mist some glass cleaner on a paper towel and begin wiping, but this can cause scratches, discoloration and leave behind residue on the pristine mountain lake you worked on for days. Use the Dust Dabber to prevent damaging your features and clean hard surfaces safely.

Product Overview

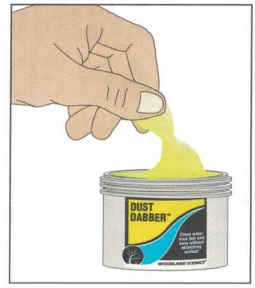
Dust Dabber®

The Dust Dabber safely removes dust, dirt and debris from your water features and other solid surfaces.

ONLINE VIDEO

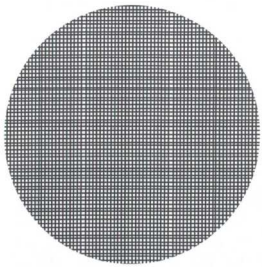


To use the Dust Dabber, pinch off a small piece and dab it over the hard surface you want clean. Do not rub the Dust Dabber across the surface; a rubbing motion will not pick up dust and debris. Knead the pinched off piece of Dust Dabber back into itself once it begins to fill, and keep cleaning until it no longer picks up debris. Discard the used piece in the trash. Do not put the used piece back into the jar.



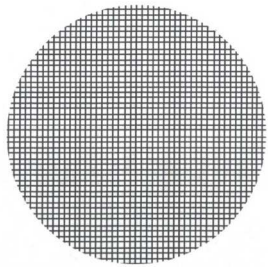
LOOSE MATERIAL

When your layout is under construction or being remodeled, there will likely be loose landscaping material that needs to be cleaned up. You can do this easily with the Model-Vac, which is designed to pick up loose material without causing any damage to your layout. It has three different sized screens intended for a specific purpose. Pick the appropriate screen and install.



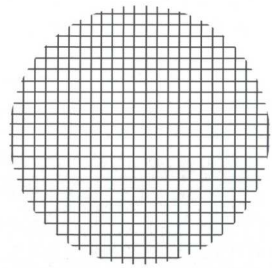
(SM)

Use **(SM)** for tiny particles
e.g. 2mm Static Grass, Fine Turf



(M)

Use **(M)** for average particles
e.g. 4mm Static Grass, Coarse Turf



(L)

Use **(L)** for bigger particles
e.g. 7mm-12mm Static Grass, Underbrush

Press the Vacuum IN button on the handle to begin vacuuming. Keep the Vacuum IN button depressed until you are ready to empty it. To empty the Model-Vac, point the Model-Vac nozzle down toward the trash or a storage bag and release the Vacuum IN button. Gently shake the Model-Vac to release the loose material from the nozzle or remove the nozzle tip to release larger material from the tube.

CLEANING PERMANENTLY INSTALLED FOLIAGE

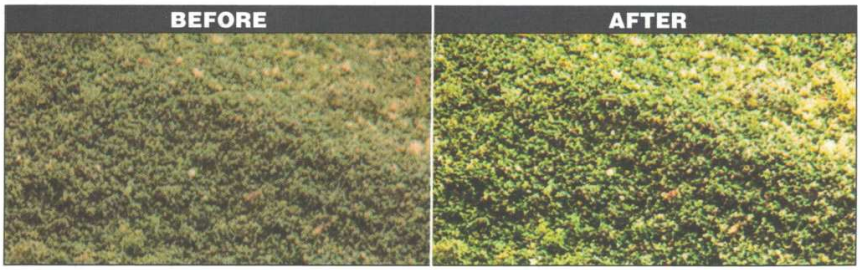
Foliage products are very porous and have tiny fibers that easily catch and hold dust. The best way to maintain permanently installed foliage on your layout is to keep the layout covered with cloth or plastic. Yet, even dioramas that are covered will begin to build up dust over time. There are two options to clean dust off of foliage; you can either vacuum it or wash it with wet water.

WET WATER

Wet water is a mixture of soap and water that, when applied, pulls dust and dirt away from the surface of foliage materials. For a light amount of dust, we recommend cleaning foliage with wet water.

Start by covering your water features to prevent soap residue. Cover Deep Pour Water or E-Z Water features with soft cloth and Realistic Water features with aluminum foil, shaped so that it doesn't touch the water feature. Then, make wet water. Mix 2-3 drops of liquid dish soap with 8 fl oz of water in the Scenic Sprayer. Mist the wet water over the foliage or turf. The foliage will be instantly refreshed. Reapply as needed. If any soap residue is left behind on the Deep Pour Water or E-Z Water, use the Dust Dabber to remove it. Soap residue cannot be removed from Realistic Water.

Realistic Water features may turn cloudy. If this happens, place a fan on in the room (do not aim it directly at the Realistic Water) to circulate the air and reduce the humidity. The cloudiness will dissipate as the water evaporates.

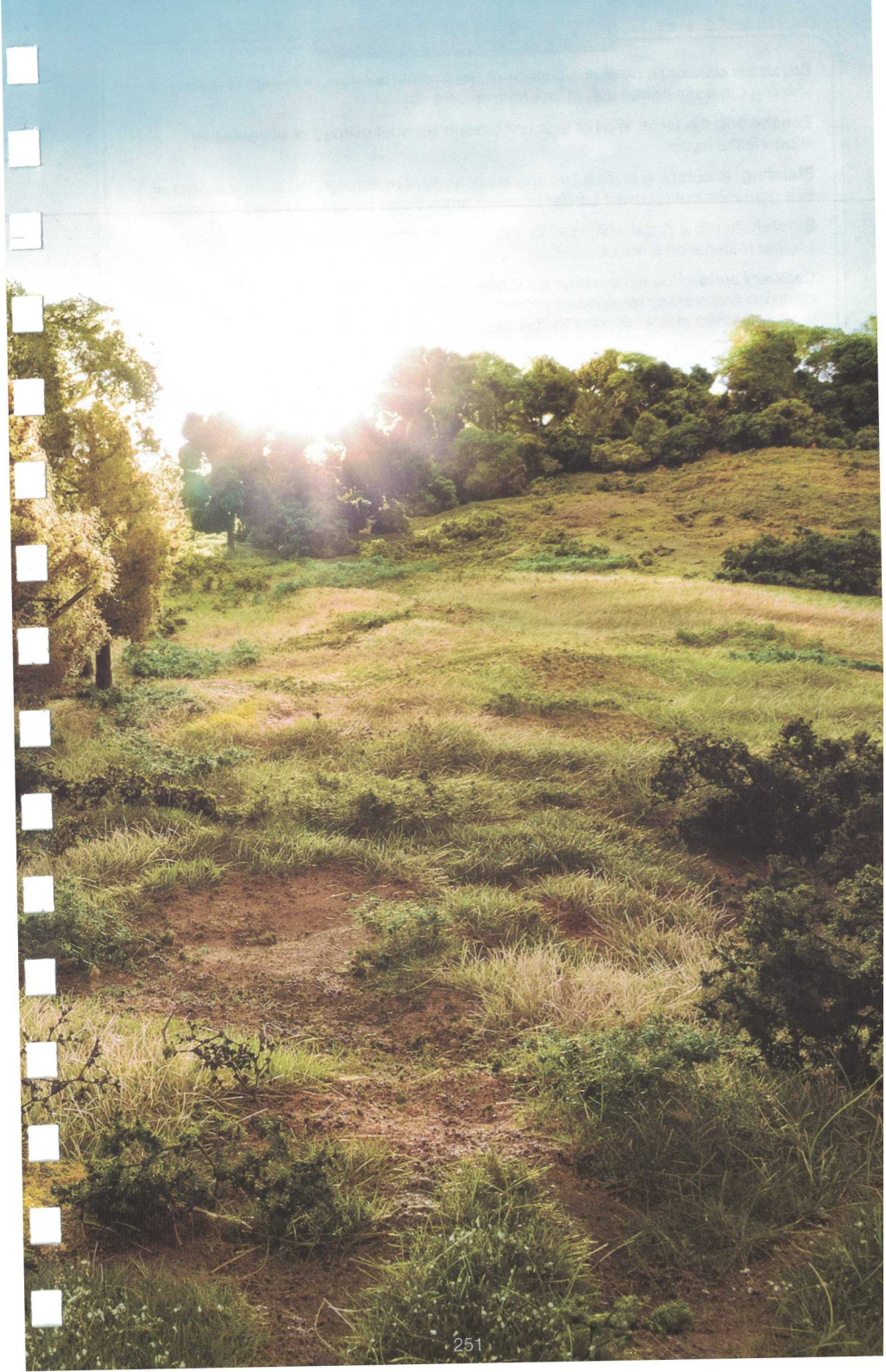


VACUUMING

If a thick layer of dust covers the foliage, we recommend vacuuming. Wrap a piece of soft, smooth fabric over the nozzle of a vacuum cleaner and secure it with a rubber band. Gently press the nozzle into the foliage and vacuum the dust up. If needed, finish cleaning with wet water. Always test the suction on a small area on your layout before you vacuum large areas.

IF DUST REMAINS

These cleaning methods may not always work. You can try to breathe some life back into your foliage by re-applying Fine or Coarse Turf over the still dusty areas. The next step is to tear out the foliage and reapply. Replacing foliage is only required on the worst dust-encrusted layouts.



Glossary

Bevel: the slant or slope of one surface or line against another, or the act of cutting or shaping (an edge or surface) at an angle or slant.

Benchwork: the table, shelf or legs underneath a model railroad or diorama that supports the layout.

Blending: to combine at least two shades or sizes of material(s), so there is a color or size gradation but no exact border between areas could be distinguished.

Burnish: to rub a decal with a tool or dull pencil to smooth onto a building, sign or another material on a layout.

Capillary action: the force, either attraction or repulsion, that is the result of adhesion, cohesion and surface tension in liquids that are in contact with solids. We use this force to allow thinned plaster or paint to flow into the depressions on a plaster casting.

Cheesecloth: a very lightweight, cotton gauze.

Clearance: the distance by which one object clears another or the clear space between them. For example, the space allowed around buildings and scenery items so that they do not interfere with the running of trains.

Contour: the outline of an object's general form, such as terrain in model scenery.

Cured: to prepare by or undergo a chemical or physical process for use. For example, a rock casting that is fully cured is hard and unpliable.

Deadfall: a tangled mass of fallen trees and branches.

Dilute: the act of adding water to a liquid pigment, weakening the full strength of the color before painting. This mixture is called a dilution.

Double track width: covering the distance across two parallel railroad tracks.

Drybrush: a technique of adding very little paint by brushing most of the paint off a brush before using it on the object being painted. Drybrushing also refers to a technique of using a dry brush to paint Fine Turf on landscape areas for detailed application.

Epicenter: the center of something, more often its powerful source. When modeling water, the epicenter is where an object enters the water, marking where a splash or wave could be created.

Flash: a thin edge of excess plastic or metal that leaks from the seam between the top and bottom of the mold during the casting process.

Flyspecking: a method of applying Fine Turf or Blended Turf that recreates the effect of having vegetation or soil on vertical terrain and rock faces, as well as moss on the sides of buildings.

Gauge: the distance between the rails of a railroad track. Most U.S. railroads use standard gauge, which is 4' 8.5". A few railroads use narrow gauges. Narrow gauge rails are closer together than the standard gauge, with 3' being the most common of those gauges to allow a tighter radius on curves.

Grade: the degree of elevation change between two points over a specific distance. Grade is an especially important factor in model railroading because the track plan must work with the layout's geographical features while still allowing the train to travel around the track.

Highlighting: a modeling trick that involves applying a lighter or contrasting color to an object to create visual depth. For example, sprinkling Fine Turf on tree foliage.

Layout Base: the material on which you build your model.

Layout Plan: a detailed sketch of specific features used to plan and design your layout.

Level: to make horizontal or flat, bringing to a common level or plane.

Light bleed: when light leaks from an object in areas where interior lighting should not be visible.

Mitered: two surfaces with edges cut in angles (beveled) and joined together to form a corner.

Module: small models that can be combined to create a larger layout.

Modular Group/Club: a group where each person is responsible for one module and the modules are combined when the group meets. These clubs usually establish a plan for how each module is to be constructed so that it will coordinate with others in the group.

Opaque: a coat of pigment, or paint, that is applied straight from the bottle so you cannot see the material beneath it.

Porous: possessing pores that are permeable to fluids and capable of being penetrated. Porous plaster surfaces provide the best absorption of a color wash.

Realistic Variation: the act of adding diversity and depth to a layout by incorporating different colors, sizes and amounts of details (such as trees and landscape), thereby mimicking nature.

Roadbed: the area directly beneath the ties and rail of a railroad track. In modeling, this refers to the material that is put directly under the track.

Scale: a proportion between two sets of dimensions, i.e., the proportion between the size of a model and the dimensions of a real train, building, person or landscape feature.

Selective Compression: the selection of a few items in an area to represent all items from that area.

Setting: the when and where of a layout. Some model railroaders base their layout by the style and era of trains they want to use, while military modelers may build their layout based on a specific war.

Sprue: the piece of plastic or metal that connects to tabs, which hold the small molded parts together.

Stain: application of a diluted pigment, or paint, to a porous surface (like plaster) which absorbs the colorant.

Sticky State: the time when a modeler can press an object into drying Deep Pour Water, making it appear as it were floating. This is also the time when another layer of Deep Pour can be poured. This state occurs approximately four hours after pouring.

Strata: a series of layers of rock that are visibly distinguished by differences such as color or texture. Strata is common in sedimentary rocks.

Surface Tension: the property of the surface of a liquid resulting from the greater attraction of liquid molecules to each other (due to cohesion) than to the molecules in the air (due to adhesion).

Tab: the small piece of plastic or metal that connects the molded part to a sprue.

Terrain Shell: the hard surface of a model that forms terrain contours (what you paint, landscape and put structures and figures on).

Track Plan: a sketch that indicates where track should run on the layout and if any overpasses or other features must be built. A track plan is part of the overall layout plan.

Transparent: being able to see through an object or liquid.

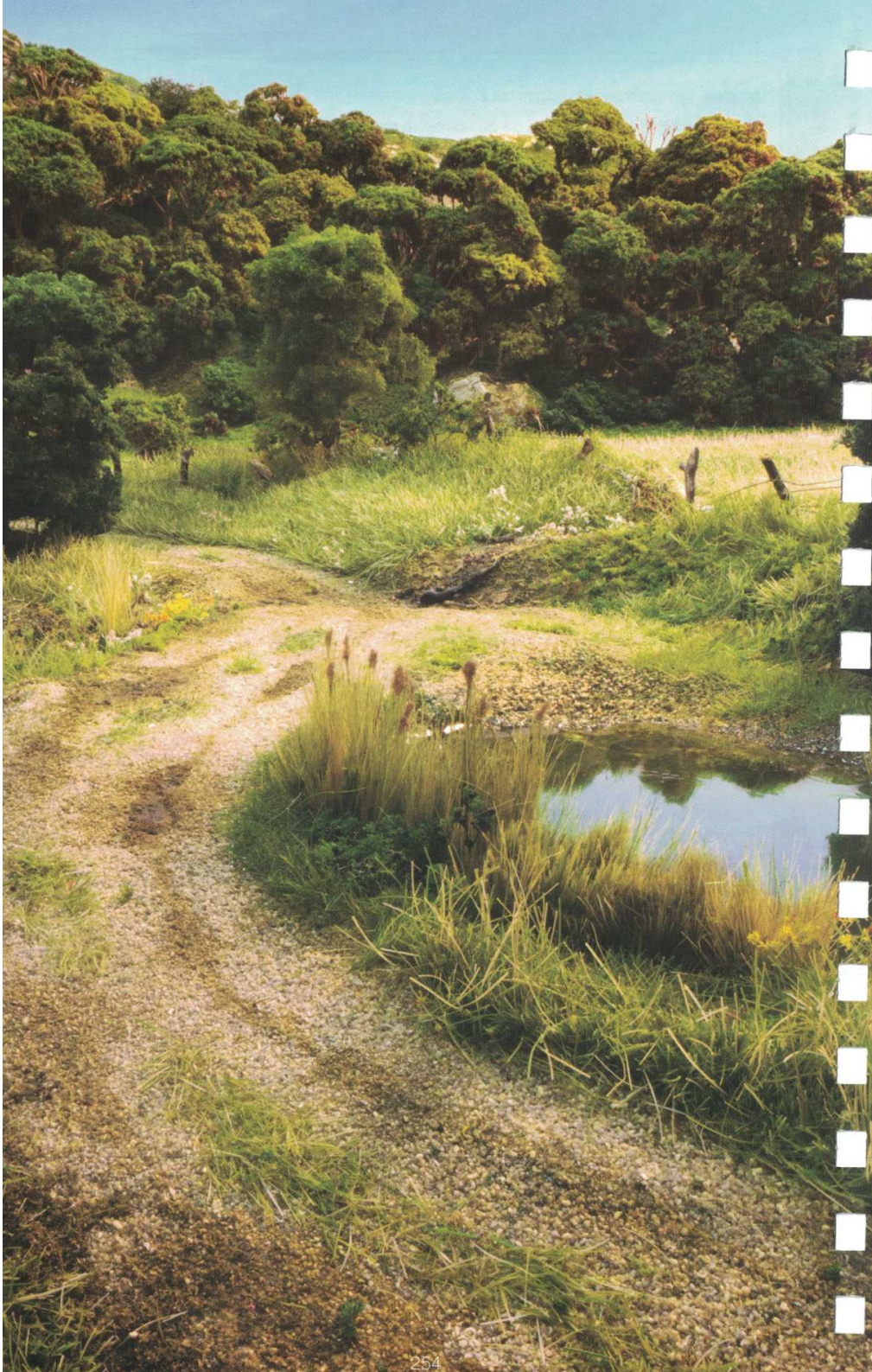
Tuft: a growing bunch of grasses or close-set plants.

Understructure: a foundation of material that supports the scenery, terrain, roadbed and electrical wiring of a layout.

Wash: pigment that has been diluted with a large amount of water. Washes are meant to be transparent so you can still see the material it is applied to. The more pigment in the wash, the more opaque the wash.

Water Cavity: the terrain basin that holds water, creating a river, lake or pond on a layout.

Wet Water: a mixture of water and liquid dish soap. The liquid dish soap reduces the surface tension of the water.



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